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ABSTRACT

Designed to assist Peace Corps volunteers to plan, produce, and use instructional materials in the classroom and in the community, this training manual focuses on materials that volunteers can produce or obtain locally at minimal expense. Included is a brief section about projected media, which are a useful means of communication in those situations where materials and equipment are available. The manual is structured under five major headings: (1) Planning Instructional Materials; (2) Using Media in the Classroom and in the Community; (3) Presentation Methods and Materials; (4) Basic Production Techniques; and (5) Writing. Many of the ideas and illustrations have been taken directly from materials prepared by students and faculty of Indiana University who have worked with international programs either on campus or overseas. Appendices include supplemental information on planning; evaluation procedures; communication factors in family planning; formulas for making hectograph copies, dyes and paints, rubber cement, and materials for models; equipment construction plans; sample illustrations; lettering patterns; a media comparison chart; notes on the use of audiovisual equipment; and sources of information. A limited index is included. (THC)

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Audiovisual Communication Handbook

Indiana University

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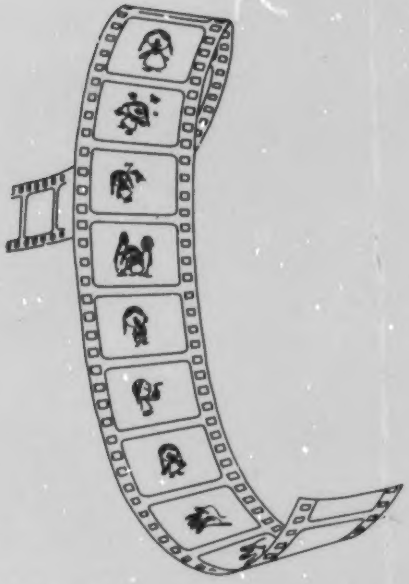
AUDIO-VISUAL COMMUNICATION HANDBOOK



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INTRODUCTION

This training manual is designed to assist Peace Corps volunteers to plan, produce and use instructional materials in the classroom and in the community. The emphasis is on materials that volunteers can produce or obtain locally at minimal expense. Included is a brief section about projected media which are useful means of communication in those situations where materials and equipment are available.

The manual is structured under five major headings: Planning Instructional Materials, Using Media in the Classroom and in the Community, Presentation Methods and Materials, Basic Production Techniques, and Writing. In addition, there is an appendix with supplementary information and a limited index for reference.

The verbal and pictorial content for this manual has come from many sources. Publications of the Peace Corps, the United States Department of Agriculture, the Agency for International Development, the Oversea Visual Aids Centre, and UNESCO have provided ideas on how to make and use media. The most valuable source of information has been the students and faculty of Indiana University who have worked with international programs either on campus or overseas. Many of the ideas and illustrations have been taken directly from materials that have been prepared either on campus or in overseas projects. The writers apologize for not giving specific credit for these ideas and gratefully acknowledge the value of all contributors to this manual, particularly the assistance of Mr. David Danielson and Mr. Kenneth Skirvin of the Peace Corps who monitored the project.

Planning plays an important part in the production and use of instructional materials. It is a process involving

statement of objectives
presentation strategy
selection of information
organization of information.

STATEMENT OF OBJECTIVES

Stating objectives is an important step, but is frequently bypassed or given minimal thought. In discussing statement of objectives and the other steps in planning, a simplified example relating to fertilizer will be used.

Often objectives are stated too generally, such as "I want farmers to use fertilizer," or "I want my students to understand the water cycle."

If the farmer's need is to use fertilizer, why isn't he using it? Does he lack information (a knowledge need)? Is he unable to use it (a skill need)? Or, doesn't he see its importance (an attitude-change need)? Once the needs are identified, state objectives that specify what farmers are to do, that is write specific objectives. Following are examples of specific objectives in the areas of agriculture and health.

Attitude-Change Needs

Agriculture. At experimental plots where fertilized and non-fertilized plants are displayed, farmers are to show their interest by asking questions about the value of fertilizers and how to use them.

Health. After a filmed presentation of the services offered by the Maternal Care Center, expectant mothers will sign up for a field trip visit to the Center.

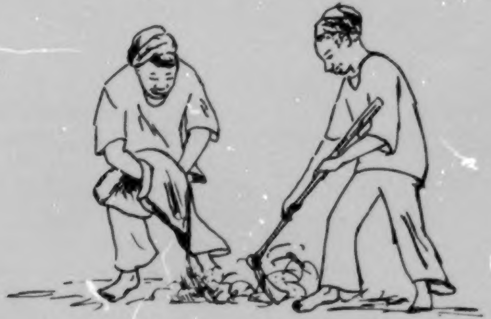
Knowledge Needs

Agriculture. Following a group presentation showing two types of fertilizers and their uses, farmers should be able to distinguish between them and be able to demonstrate their understanding by explaining when and how both fertilizers should be used.

Health. At the end of a visit to the Maternal Care Center, expectant mothers are able to answer questions about the services the Center can offer them.

Skill Needs

Agriculture. After receiving instruction about applying fertilizers, farmers should be able to demonstrate the correct way to apply them.



Health. Following a demonstration of how to bathe a baby, an expectant mother is able to demonstrate, with a "doll-baby" model, the following points: testing for proper water temperature; holding the model as different parts of its body are washed; drying and dressing the model.

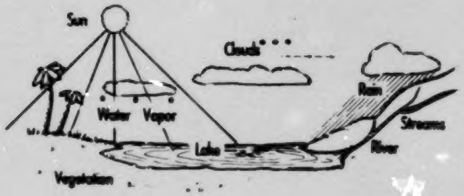
Note that a specific objective indicates the means of evaluating the success of a presentation or an instructional material. For the health objective above, how can the demonstrator determine whether or not the objective was achieved? She can find out by asking an expectant mother to bathe the "doll-baby" model, and she can evaluate the mother's performance against the four points stated in the objective.

Attitude, knowledge, and skill needs are not mutually exclusive. Providing information is essential whether the need is for information, for skill, or for changing an attitude. If farmers have never heard of fertilizer, and if the ultimate objective is to have them make a practice of using it regularly and correctly, the objectives must satisfy all three kinds of needs. If, on the other hand, farmers have information about fertilizer and are willing to use it, but lack skill in applying it or keeping it from washing away after application, then the objectives should focus on giving them these skills.

PRESENTATION STRATEGY

Identifying needs and stating specific objectives are prerequisites to making decisions about the presentation strategy. The presentation would not require pictures if the specific objective is: **When questioned, students should be able to enumerate the major elements in the water cycle.** Words naming the elements might be written on a chalkboard or given to each student on a slip of paper, or the words might be said with students repeating them. The teaching strategy would differ, however, if the objective is: **In a test situation, students should be able to draw a diagram of the water cycle that shows the major elements and their relationship to each other.** For this objective, illustrations would be needed so students would have a model of what they are supposed to be able to do.

THE WATER CYCLE



Consider the attitude-change objective given for agriculture on Page 2. This objective states a decision to take farmers to experimental plots to give them first-hand experience with the results of fertilized and non-fertilized plants and their yields. This visit can be considered the presentation strategy. What will be done during the visit, and what farmers will be encouraged to do at the experimental plots must be planned. Some exhibits might show crop yield from the fertilized and non-fertilized plots. The farmers might be encouraged to examine the plants in each plot or to compare the size and weight of crop yields from the plots. Also questions they ask should be answered to give them assurance that fertilizing is something they can do themselves, is not too time consuming, and, in terms of crop yield, is not very expensive.

The knowledge-need objective, given for agriculture on Page 2, states that a presentation should give farmers information about fertilizers and their uses. To present this information in a group situation, visual materials are needed. If facilities and resources are available to make slides and tape recordings, the medium chosen for this presentation could be a set of slides with a taped narration. As a follow-up of the slide-tape presentation, another first-hand experience should be provided—the opportunity to apply the fertilizer in a near-by field.

Stated objectives also influence whether a single medium will be adequate to present the information, or whether other media will be needed. The stated objectives will help determine whether the information should be given in a single presentation, or whether several presentations will be needed. Consider farmers who know nothing about fertilizers. Their interest must be stimulated; they need information about fertilizers; and they must become skilled in applying them. The stated objectives might be similar to those given on Page 2.

When preparing objectives, the emphasis should be on WHAT is to be accomplished. When selecting the presentation strategy, the emphasis should be on HOW to meet the goal. Can an objective be accomplished in one presentation? If not, how many separate presentations will be needed? How much information will be presented in each segment? If several sessions are needed, should they be spaced over a period of time or concentrated? What medium will be used in each presentation? Answers to these questions should come from the objectives and a knowledge of the audience's characteristics.

Age level, for instance, is a starting point for determining how many ideas should be presented and how complex these ideas should be. A child cannot assimilate as many ideas in a given span of time as an adult. Ideas must be presented to him with several repetitions of the information and many examples. An adult may not be literate, but he does have experience which enables him to understand complex ideas and to assimilate them quickly.

Education is another factor. For people who have had little or no schooling, who cannot read, and whose experiences have been limited to life within their village, the concepts presented must be in a form they can understand.

HOW to meet the objectives also requires attention to details. A planning check list is helpful. Following is an example for the farmers' visit to experimental plots (agriculture attitude-change objective, Page 2.).

- ☐ Transportation available to take farmers to and from experimental plots.
- ☐ Information given farmers about departure time and place.
- ☐ Experimental plots ready for visit.
- ☐ Exhibit of crop yield from fertilized and non-fertilized plants ready.
- ☐ Plan made for dividing farmers into small groups after arrival at experimental plots.
- ☐ Demonstrators available to host each small group. Should be qualified to answer on-the-spot questions.
- ☐ Procedure planned for rotating small groups so each will see more than one experimental plot.
- ☐ Large group meeting place available for question-answer period.
- ☐ Leaflet summarizing visit duplicated and ready for distribution at close of question-answer period.
- ☐ Attention called to announcement in leaflet of presentation demonstrating application of fertilizers. Date, time, and place emphasized.

Cultural differences must be considered when planning presentations or instructional materials. Following is a list of problems in visual perception, by no means exhaustive, which may serve as a guide to the kind of things to look for.

- A viewer may not be able to identify the subject of a flat photograph. For example, a father might not recognize a photograph of his own son. Instead, what he perceives is a gray shape on a white background.
- Many cultures, unexposed to the western visual habit of taking in an entire television picture, slide or movie frame, may fail to get the intended message, no matter how obvious. Instead, viewers may focus on one element in the picture before them and miss all other elements in the picture. Marshall McLuhan in *The Gutenberg Galaxy* cites the example of a film showing sanitation methods to remote tribesmen. In one scene the audience saw only a chicken moving through the background and missed completely seeing the demonstrator, thus missing the intended message.
- In a sequence of drawings or photographs, the viewer may see each illustration as a separate entity without relation to the sequence. Despite such cues as a distinctive shirt pattern, the viewer may not recognize that a man shown in comic-book fashion is the same man from frame to frame. Is it also true of a photo of a man as well as one rendered in comic book fashion? Position within the frame and position of the subject also may affect perception.
- Drawings or photographs made at an unusual angle to the object may be confusing. An eye-level point of view is the most natural. A bird's-eye view of a rice paddy may be meaningless unless the viewer has had the experience of climbing a hill and looking down on the paddies.
- Drawings may seem to be truer representations of reality than photographs because drawings are simplified and concentrate on important elements.
- Depth perception in pictures can be confusing, and is radically different than that in life. People accustomed to graphic conventions see converging railroad tracks and small distant trees as a phenomenon of perspective. To others, they may seem to be tracks that do meet and dwarf-sized trees.
- Picturing an object partially obscured by another object to show that the first is behind the second may lead to the belief that the object in the rear is mutilated or incomplete.
- It may be that a viewer can comprehend both realistic photographs and stick figure drawings and yet not recognize drawings falling between two extremes.
- Illustrations which are larger or smaller than life size may be confusing. A six-inch drawing of a mosquito may seem to the viewer to be a giant insect not found in his area.
- Cutaway drawings or models may be interpreted literally. A sketch of a latrine with one wall partially removed to show internal construction may lead to the building of a latrine with a part of one wall missing.

- In an illustration, shadows or shading may be interpreted as dirt, disease or hair.
- The symbolic significance of color or certain visual forms may override the intended significance. A yellow poster announcing a meeting may draw slight attendance if yellow means danger to the prospective audience.
- Some cultures have unvarying symbols of identification for position, status or sex. The omission of these symbols from an illustration may negate the artist's intent. In one case, pictures of girls not wearing beads were taken to be pictures of boys with large breasts.
- Clothing details may vary only slightly from one village to another. In one instance, women did not identify with drawings representing them because head ties were incorrectly located.
- Although the left to right sequence is natural to us, it may not be the natural sequence in other cultures.
- Actions portrayed may be interpreted as applying to only one sex. A poster urging that villagers be inoculated showed a doctor giving an injection to a woman. As a result, few men participated in the program.

Two steps may be taken to help avoid problems in visual perception. First, notice what kinds of visual media are commonplace among the audience. What does their art look like? Second, try out illustrations in a presentation with a representative sample of the audience. Question them about the visuals:

What is this?
What does this picture mean to you?
What is the farmer doing in this picture?
Can you explain what this picture shows?
What story did all the pictures tell you?

Notice reactions of the sample audience. Question snickers, perplexed looks, loss of interest. Ask, how would you draw or change the picture?

SELECTION OF INFORMATION

The stated objectives are the basis for selecting information for each strategy. Some objectives may relate more specifically to a single presentation. Other objectives may relate to several or most presentations.

In the case of the slide-tape presentation the main objective is to give information. Therefore, the knowledge-need objective for agriculture (Page 2) is a guideline for selecting the information that should be included in the slide-tape.

In a classroom situation, for instance, a unit on water is to be taught. A part of this unit deals with the water cycle. One of the stated objectives is: **in a test situation, students should be able to draw a diagram of the water cycle that shows the major elements and the relationship of each to the other.**

A flip chart is selected as the presentation strategy. The objective requires that this flip chart include the names of the major elements (evaporation, condensation, and precipitation) and that it show the relationship between the major elements. How to organize the information in the flip chart is the next step. Similarly, this is the next step in planning the slide-tape about fertilizers.

ORGANIZATION OF INFORMATION

Flip charts, leaflets, slides with taped narrations, filmstrips, motion pictures, radio broadcasts, and telecasts are linear; that is, information presented to the audience follows a sequential order from beginning to end as arranged by the producer.

After the information to be presented has been collected, the first step in organization is to prepare a ***content outline.*** An outline requires arrangement of the information in a systematic order. It enables a quick check for extraneous material or omissions of essential information, and for the evaluation of the information included against the stated objectives. A **sample content outline** for the slide-tape about fertilizers is given in Appendix 1, Page 83.

After preparing a content outline, the information needs to be organized in a more detailed fashion which is a **treatment.** The treatment for a flip chart or a leaflet is a rough sketch of the final layout which shows the location of the visual and verbal elements. This rough sketch serves as a script. The producer proceeds from the treatment to the finished product.

For slide-tapes, filmstrips, motion pictures, and telecasts, the **treatment** is a narrative account that indicates how the content information is to be arranged and what part of the message will be carried by visual and what part by verbal elements.

What form will the presentation of the content take? Will it be a straightforward explanation? Will it be in a story form? The treatment for the fertilizer slide-tape could be a story about Farmer A and his success in using fertilizer; or the story might contrast Farmer A who uses fertilizer with Farmer B who does not. An example of a **treatment** for the slide-tape is given in Appendix 1.

The final step in organizing information for slide-tapes, filmstrips, etc. is the preparation of a **script.** Scripts are usually in two columns—one column a verbal description of the scene, the other the accompanying narration. When a sketch of the verbal scene description is added, the script may be referred to as a **storyboard-script.** A script or storyboard-script [illegible] a blueprint for the photographer or artist. A portion of a **storyboard-script** is given in Appendix 1.

In summary, planning is an interrelated step-by-step process.

Statement of objectives. WHAT is to be accomplished as related to identified audience needs. The objectives should be stated to indicate what audience need is to be fulfilled.

Presentation strategy. HOW objectives will be accomplished. The **How** should take into account audience characteristics and available media resources.

Selection of information — CONTENT of each presentation. What is selected must be based on the stated objectives and checked against them.

Organization of information — SEQUENCE of the content from a simple outline to the detailed script. This is the last step before production. Like previous steps, the script should be checked against the stated objectives.

The material in Appendix 1 shows the application of the four steps relative to the slide-tape about fertilizers.

EVALUATION

At each step of planning and producing and in the use of instructional materials, some kind of evaluation should take place. This evaluation may range from asking a few simple questions of the intended audience, such as those given on Page 5, to highly controlled evaluative studies. Regardless of the simplicity or complexity of the evaluative procedures, the following should be evaluated.

- The **idea** to be communicated by the message—
  Is it important, useful, valid?
  What new behavior is desired on the part of the audience?
- The **receiver** of the message—
  Will he be able to understand the message idea?
  Will he consider the message relevant?
  Will he be able to do what the message asks?
  If not, what message does the audience need?
- The **message material** itself—
  Is the message accurately prepared?
  Is there anything about the message that might offend?
  How will the message be disseminated to reach the intended audience?
- The **presentation** of the message—
  Was it timely?
  Was it clear?
  Did it permit audience feedback?

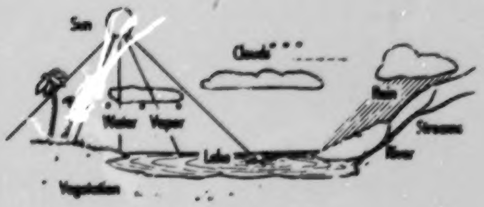
Throughout this manual frequent reference will be made to the importance of evaluation and to simple evaluative questions that can be asked or simple methods that can be used. Additional information about questionnaires, sampling techniques, and interviewing procedures are given in Appendix 2.

IN THE CLASSROOM

In formal education in the classroom, media used properly can greatly increase learning. There are no rules that state exactly what medium to use in any given situation. A unit on the water cycle could be taught with a

filmstrip
chart
flannel board presentation
simple chalkboard drawing
flip chart.

THE WATER CYCLE

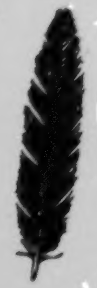


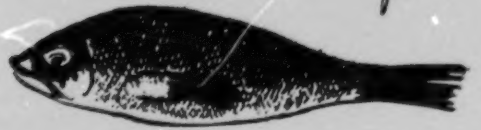
What is chosen will depend largely upon the objectives of the instruction and the media available; however, characteristics of the various media and instructor preferences will influence selection. Following are suggestions for use in several subject-matter areas.

Science

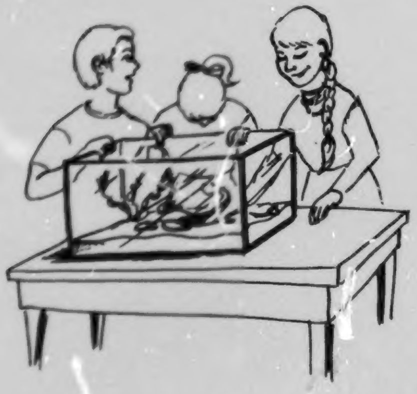
The world is an interesting place for the child; he is continually asking the question "why." This curiosity about the world opens a natural avenue for introducing the child to science and scientific study. Through the use of media, many elements of his environment can be brought into the classroom for the child's study of science in meaningful activities.

- All around are things to collect—plants (seeds, blossoms, roots, stems); soil varieties (sand, gravel, clay, loam) rocks, minerals, fossils, shells, bones; chameleons, mice, snakes, fish, insects; feathers, eggs, hair, skins. Such collections are basic to exhibits and displays.

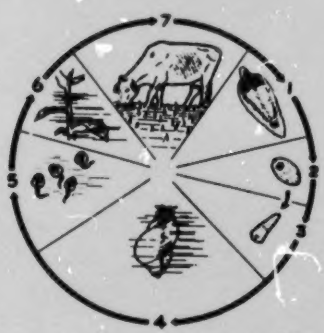




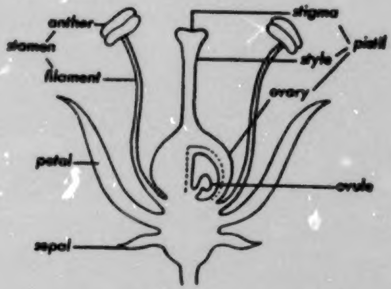
Students will become involved when they contribute individually to the collections. Group involvement can be accomplished through class field trips to collect items. Students will learn firsthand the source of collectable items and gain knowledge about the natural habitat of insects, seeds, etc. Writing about their collecting experience integrates science and language arts activities.



- An aquarium or cages are means for keeping fish and small animals alive in the classroom. Making students responsible for the preparation of containers and the care and feeding of fish and animals provides valuable first-hand experience. The UNESCO handbooks on the *Teaching of Science in Tropical Countries* offer good suggestions for building cages, feeding, and animal care. Science, health, and math skills can be integrated when pupils keep charts and records of the animals' food consumption and weight increases.
- Conducting experiments is fundamental to successful science teaching. Basically, an experiment is a demonstration. The UNESCO handbooks, previously mentioned, offer many suggestions for simple experiments for which resources are available in most villages.



- Diagrams are useful for teaching cyclical concepts—the water cycle; the life stages of an insect; the oxygen-carbon dioxide cycle.



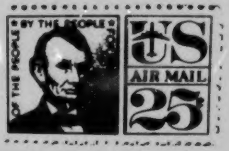
- Cross-sectional drawings can show what the inside of things look like—the organs of a typical flower; a slice of skin; the working parts of an engine.
- A model of the solar system can show relative sizes of the planets and sun and their distances from the sun and from each other. The sun and planets can be made from clay or paper maché (papier-mâché). Wire clothes hangers can be cut, straightened, and attached to a base. The paper maché sun and planets can be affixed to one end of the wire. Math skills can be integrated with science skills for determining the relative sizes of the sun and planets. To help students grasp the idea of the solar system in space, a classroom mobile with sun and planets suspended from the ceiling may be more helpful than a model.
- Dramatizations or puppet shows can depict the life of some of the great scientists such as Pasteur. If a tape recorder is available, record the dramatization for school or community gatherings. [illegible]s' drawings can be substituted [illegible] dramatization or puppet shows to be used with the tape-recorded dramatization. If a 35mm camera is available, these drawings can be photographed for a slide set and filed for use in the next school term. Also, the dramatization can simulate a radio broadcast. Have students write the dramatization or puppet show to integrate science experiences with language.

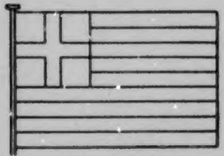
Social Studies

- Dramatizations can simulate the action of local governments such as the village council. Let students role play various governmental officials, as the town mayor, to give more meaning to the duties and responsibilities of these officials. A "little" United Nations can provide experience in governmental actions that take place between nations.

officials. A "little" United Nations can provide experience in governmental actions that take place between nations.

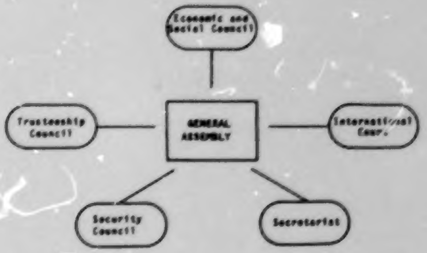
- Collections aren't limited to science. Postage stamps of most nations depict past historical or current events. Flags, coins, articles of clothing, cultural artifacts, even letterheads that feature governmental seals or symbols can be used for analysis and interpretation. One teacher in a secondary school made a thermal transparency of the presidential seal and asked students to give their interpretation of each symbol contained in the seal. This discussion was followed by student investigation and study of the historical development of other national symbols.





- Tape-recorded interviews or discussions with national or world leaders can bring immediacy to a current event that might be lost in a three-day-old newspaper report. Such interviews can be taped directly from a radio program.
- Charts can show the method used by governments to collect and disburse taxes. How tax money is spent can be shown with a pie graph.

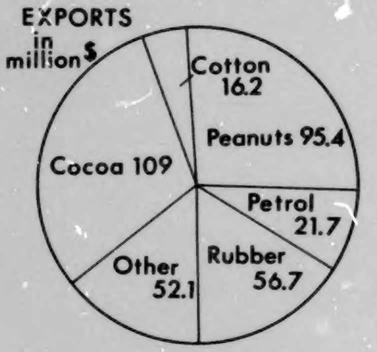
- Charts can easily be made to depict the various levels of government—federal, municipal, or states, provinces or regions—or to show steps through which a bill passes to become a law. The latter lends itself to dramatization and role playing by students.

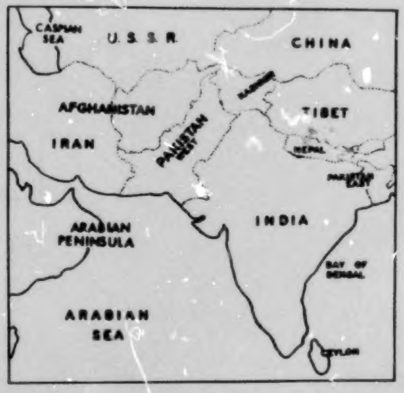


- Geographical concepts can be made more concrete by models. A geography teacher in Malaysia and her students converted a back corner of the school grounds into a miniature waterway system. A main stream and several tributaries were dug and lined with a thin layer of concrete to prevent erosion during heavy rains. A few hills, with and without grass, were built, and signs labeling various parts of the system were installed. As students watched the flow of water during and after a rain, such words as tributary, confluence and erosion began to have meaning. The students were then ready to locate geographical features on a map. Many were able to draw relationships between such ideas as rainfall and size of river system.

- When globes are not available, students can make their own. One teacher and her students made a globe, four feet in diameter, of chicken wire and paper maché. Lines such as the equator, as well as continents and nations, were painted on. Math skills in measuring and drawing to scale were integrated with this geography project.

- A field trip to village markets or shops selling foreign wares is a good "opener" for the study of trade or the export-import business. An export-import bulletin board display could be prepared as a summary of the field trip experience. Or, to tie in with mathematics, students could prepare graphs comparing the monetary values of exports and imports relative to their country's economy. The graphs could also be used in oral and written reports about trade—an opportunity to integrate meaningful subject matter with the development of skills in oral and written expression.



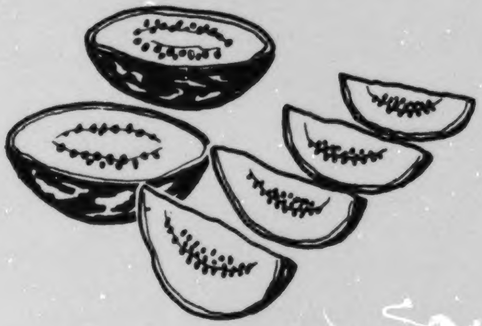


- Maps are a "must' for teaching geography. A teacher, concerned that the weekly radio lessons were not getting physical geography concepts across to to her students, drew a large wall map on a cement sack with charcoal. Colored chalks could have been used had they been available. Before each radio lesson, she put on the wall map the words and symbols that would be mentioned in the broadcast (as stated in the teacher's manual). These words and symbols were made large enough for students to read from the back of the classroom. Also, using a hectograph, she reproduced an outline map for each student. During the radio lesson, the classroom teacher pointed out on the wall map the various features mentioned by the radio teacher. After the radio broadcast, the students put the information from the wall map on their own maps. By the end of the series of radio lessons, each student had made his own map of the physical features of the country.

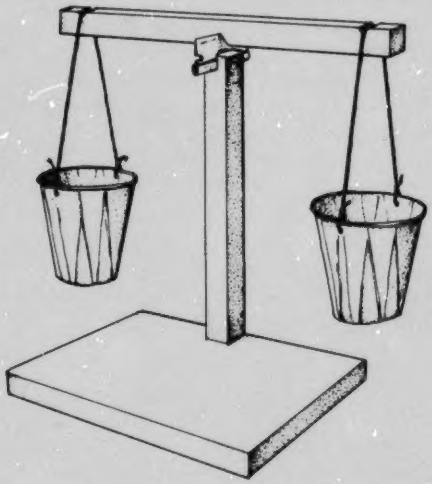
Mathematics

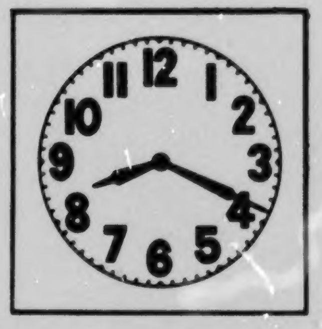
All mathematical concepts are abstractions. To understand these abstractions, children need various kinds of concrete experiences. Media are useful not only to establish a concrete base for mathematical thinking, but also to create interest in the practicality of mathematics.

- Real objects such as stones, beads, and coins can be used for counting. They give a concrete base for understanding the one-to-one relationship and for developing concepts of "more than," "less than," and "equal to." Some objects such as fruits and vegetables can be divided to show major fractional parts like halves and fourths. Sticks of varying lengths can be used for measuring and for developing concepts of "longer than" or "shorter than." Objects cut to proper length or selected for their proper weight bring concreteness to systems of measures and weights, such as the metric system. Real objects also provide tactile as well as visual experiences.



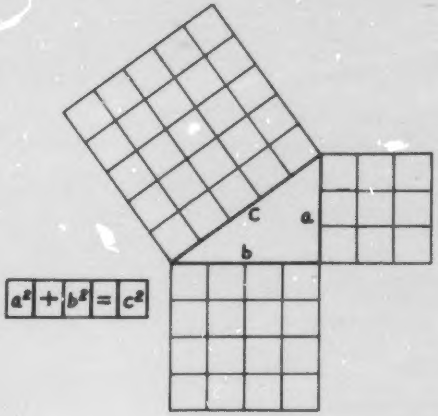
- Teacher-made instruments can clarify measuring concepts. One Latin American teacher made several simple, double-pan balances by using a notched stick balanced on the edge of a razor blade, some thread, and a couple of paper cups for each balance. Weights consisted of coins, paper clips, and pins. Ten pins equaled a paper clip, and ten paper clips equaled a coin. By having the children weigh a number of objects, the teacher was able to introduce numerical concepts which established a base for understanding the decimal system. There are numerous opportunities for including measuring experiences in science and social studies activities. When integrated with these activities, the practicality of mathematics can be made more evident to the student.





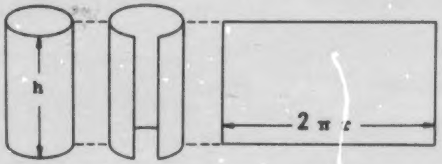
- Paper-made objects (calendars, play clocks, play money) can be made by the children. Then, each will have his own for seat work on problems involving time or money exchange concepts. A large paper clock with movable hands can be hung on the classroom wall. Throughout the day, the hands can be placed to indicate the time when certain activities will take place—time for reading, recess, lunch. Pupils can participate by being given the responsibility for setting the hands to show at what time the next activity will take place.
- A walking trip through the village or area surrounding the school to observe geometric shapes in real life can be used as an introduction to geometric forms. The trip can be supplemented by a bulletin board display of pictures of the things observed—buildings, bridges, bicycles. Test the children's recognition of forms by having them label the pictures with the names of the forms illustrated in the pictures. Children can also be asked to look for geometric forms in their classroom.

- A step-by-step flannel board presentation of the derivation of the formula
  $a^2 + b^2 = c^2$
  can clarify the meaning of this formula.



- String models of geometric forms such as cones and pyramids can be constructed. By projecting a thin beam of light across the model at various angles, sections of these forms can be shown. A projector isn't needed. A slit cut in a piece of cardboard covering a window where the sun comes through can be the source of light.
- Student-built models to scale or maps drawn to scale can provide concrete examples of the meaning of "ratio." Such experiences can be integrated with science and social studies projects.

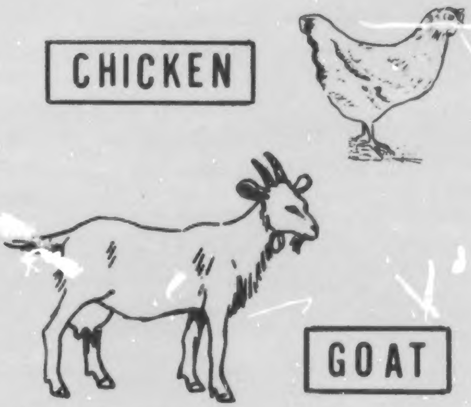
- A transparency with overlays can show geometrical relationships, for example the relationship between a rectangle and a right-angle triangle or between a parallelogram and an isosceles triangle. Also, the relationship of area of triangle to area of rectangle can be clarified. Other formulas can be explained similarly, for example the formula $A=2\pi rh$ (area of the lateral surface of a cylinder).



Language

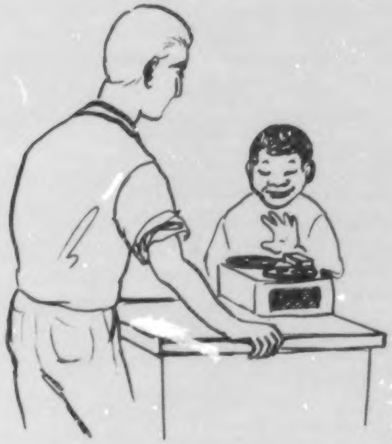
Language requires the development of skills in reading, spelling, listening, and writing. To read, the child must associate the spoken word with written or printed symbols. To write, he must develop and refine hand motor skills to reproduce the symbols. To spell, he must hear sounds and be able to distinguish one from another as well as to arrange the symbols for sounds in the correct order. Media are essential not only to the development of language skills, but also to stimulate written and oral expression.

- Pictures of objects can help the child associate words with their printed symbols. Used in a flannel board presentation, children can match words with pictures in a classroom recitation period. The same pictures displayed on a bulletin board along with the word symbol serve as a ready referent during a reading study period. See Basic Production Techniques, Projection Tracing for an easy way to reproduce pictures in magazines and books which can't be cut up. See also Basic Production Techniques, Squaring and Pantograph for enlarging or reducing pictures.

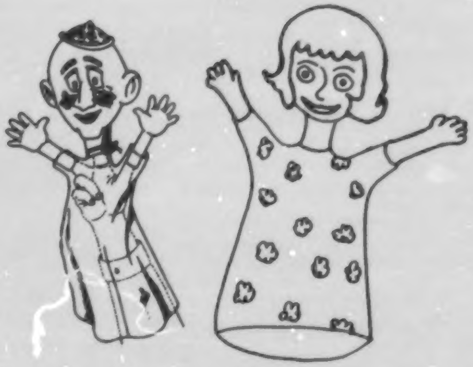


- The tape recording is invaluable for developing listening skills. Students need to hear words, phrases, and sentences pronounced properly by several different speakers. Additionally, they benefit from hearing their own voices and by comparing their pronunciation with that of the speaker. The motivation to learn that seems to accompany hearing one's own voice is often just as important as the improvement in pronunciation. Recorded sounds can be used in sound discrimination drills.

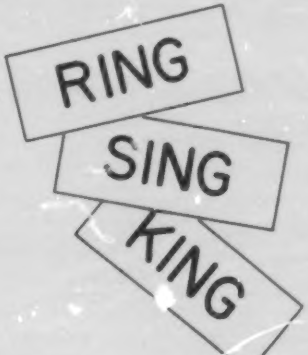
- Tape recordings can be made of stories. By stopping the tape when a sequence of events in a story has ended, children can be stimulated to tell what will happen next. Then, by turning on the tape recording, they can check the accuracy of their responses.



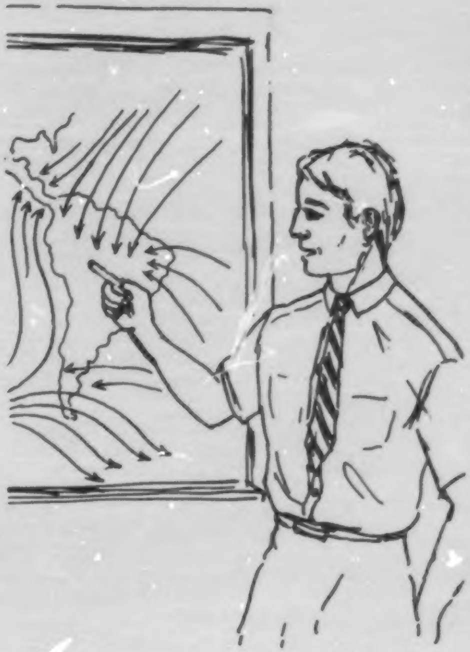
- Tape recordings are also useful to build a background in the literature, poetry, and music of a country. Such recordings can be integrated with social studies when a particular country or nation is being studied.
- Dramatizations and puppet shows are another useful way for children to learn to tell stories. When reading, writing, and spelling skills are sufficiently developed, writing their own puppet show provides for using language skills creatively.



- Flash cards are suitable for many kinds of drill—word recognition, word ending usage, words that will complete a sentence. These cards also can be used on a flannel board in various kinds of matching exercises. Keep the student involved. He should be encouraged to participate fully in the lesson by actively manipulating the flash cards or the flannel board pieces.



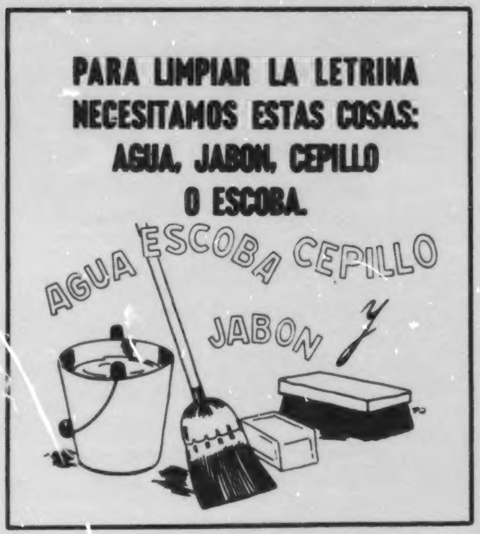
- "Chalk talks," in which the teacher draws a scene on the chalkboard as she tells a story, also can be used for word symbol recognition and identification. To help children learn to sequence events in a story, they can be encouraged to tell what will happen next in the story so the teacher can draw in the next scene. See Presentation Methods and Materials, Chalkboards, for information about making stencils to reproduce illustrations in chalkboard drawings.



IN THE COMMUNITY

Media can contribute to communication in the community as well as in the classroom. Programs in agriculture, health, family planning, community development, and co-operatives can all be more effective when a variety of media is used. Many of the ideas that have been found effective in the classroom can be adapted for informal group presentations.

Frequently, in dealing with adult groups, the audience is relatively large, and may be scattered over a wide geographical area. Also the subject being communicated may be complex. In such cases a "campaign" with a positive approach to the subject may be most effective. Spot announcements over radio, newspaper ads or simple posters can attract attention. Demonstrations, slide shows, films, puppets or plays can impart information. Experts in the field can be used to reinforce presentations. Printed materials such as leaflets can be used to follow up the presentations. Audience consideration determines the selection of media. What may work well in one culture may be out of place in another.



Before planning the media to be used in a campaign, try to find answers to a number of questions, as for example:

What per cent of the audience can read?

What per cent have radios?

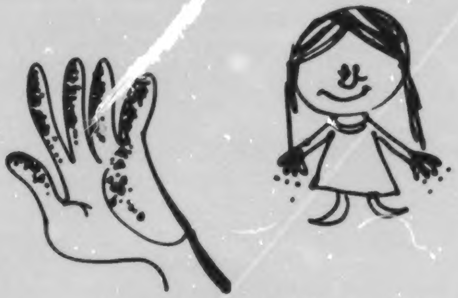
Will radio spot-announcements of a coming event reach more people than a wide dispersal of announcement posters?

To what medium are the people most likely to respond favorably? Have they previously had an unpleasant (or pleasant) experience with a particular medium? For example, an unpleasant experience with an earlier film presentation which depicted them in an unfavorable light may make them unresponsive to the announcement of an evening film program.

When using a campaign approach to meet a community problem, a unified approach can help make the communications more effective. This is a common technique in advertising where symbols such as the famous dog and phonograph or well-known slogans immediately bring other ideas to mind.

Watch the choice of symbols. It is easy to choose one that has meanings other than the one intended. In Africa one campaign had to be completely redesigned because the original symbol used on posters and leaflets was mistaken by many for the symbol of a political party.

Human symbols have also been used effectively in many places. The idea of Mr. Good Farmer and Mr. Bad Farmer translated into the appropriate local terms is often useful. Mr. Good Farmer does everything properly and is rewarded with health and wealth. Mr. Bad Farmer does everything poorly and is stuck with poverty and misery. Exercise care in portraying Mr. Bad Farmer so he does not resemble anyone in the intended audience. In many cultures there are local versions of Mr. Bad and Mr. Good that can be readily adapted.

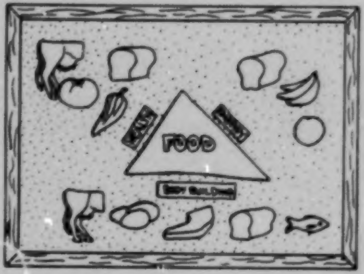


Another type of characterization to carry through in a "cleanliness" campaign might be that of the "Delores Dirty Paws" type. She never washes her hands and consequently gets diseases that could be avoided.

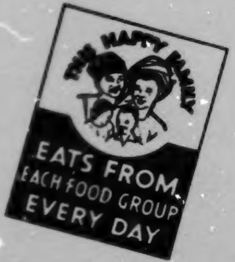
Such characters can be used in leaflets, puppet shows, dramatic presentations, and filmstrips; on posters and flip charts; or in radio shows, if distinct voice differences are maintained.

The use of several media to complement and supplement each other in a "campaign" approach is important. In a campaign approach, the same message is simply told with a variety of media. Some of the best applications of this approach have been carried out successfully in the area of health. The campaign approach was successful in India and Pakistan to help solve complicated problems of family planning. An outline of some communications factors in family planning is included in Appendix 3. Such a list cannot be adopted verbatim for use in another culture but can be adapted to serve as a basis for planning in other places.

Campaigns have been carried out in many places to promote the consumption of protein-rich food which can be transported, sorted, and provided at a cost within the economic means of the millions of people who need protein. The following are some of the techniques that have been used in these campaigns.

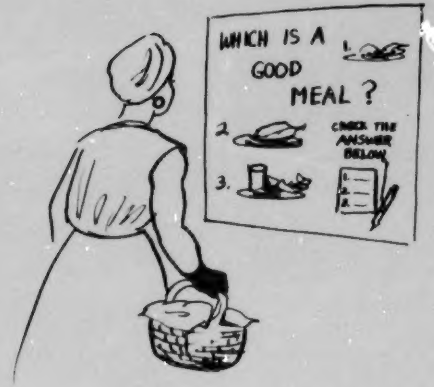


- **Flannel board** presentations depicting the food triangle of health, energy, and body building foods can teach the importance of protein-rich foods in diets.
- **Public address systems** in a market area can create interest and communicate information about diet and nutrition to a large segment of the population. In some cultures, the church is a good place to reach large numbers of people for announcements of coming events.
- **Film presentations** usually will attract crowds. In one country, cartoon-entertainment films were shown as part of a campaign to improve diets. Part of the entertainment film was shown, followed by a doctor's lecture about the values of eating protein-rich foods. Then the remainder of the film was shown. This effective attention-getting strategy is adaptable in many places.
- **A puppet play,** especially written for a campaign to improve nutritional standards in Mexico, effectively portrayed characters representative of those found in the community.
- **Posters** can announce various campaign activities and can remind people that a campaign is in progress.



- **Demonstrations** of ways to cook fish or other high protein foods can be given at agricultural or health shows or at the market place.
- **Leaflets** can be produced to describe the values of high protein foods, list sources for such foods, and suggest ways of cooking them.
- **Exhibits,** set up in the market or at an agricultural fair, can display high protein foods and emphasize their value in the diets of children and adults.
- **Plays or skits** can be presented at public meetings.
- **Newspaper advertisements** and **radio spot-announcements** will keep the public aware of an on-going campaign. Use them to emphasize important points.

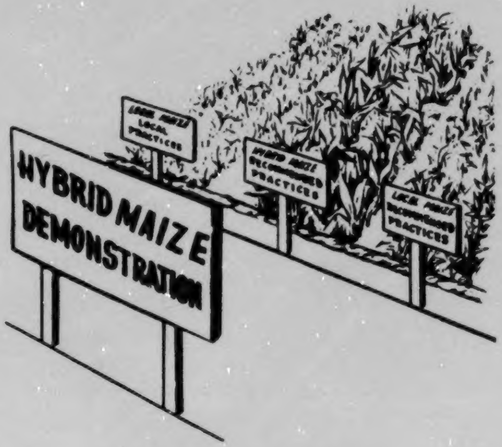
- **Exhibits,** set up in the market or at an agricultural fair, can display high protein foods and emphasize their value in the diets of children and adults.



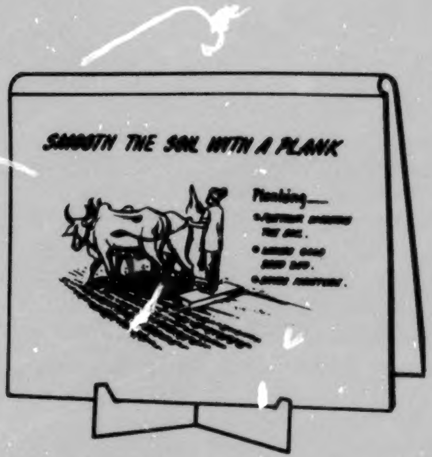
- **Booklets** describing the values and sources of protein-rich foods can supplement other materials in literacy programs.
- **Games** similar to Bingo or Lotto in which foods are matched to their functions can be designed. Similarly, simple crossword puzzles are effective with literate audiences. The clues should relate to specific local foods and their functions.
- **Campaign themes** can use characterizations such as "Delores Dirty Paws" who never washes her hands or "Polly Protein-Poor" who changes her family's diet to include more protein each day.

A few ideas that have been successful in the area of agriculture are:

- **Demonstrations** frequently are used to communicate steps of a specific process such as fertilizer application or egg sorting. Announce demonstrations in advance with posters or by one of the local news media. A realistic demonstration provides opportunities for audience feedback through discussions or question-answer periods.

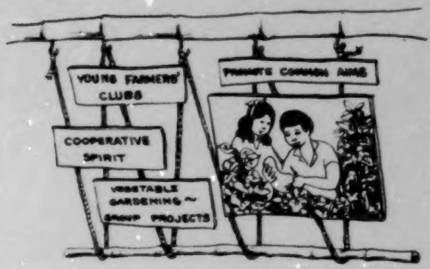

HYBRID MAIZE DEMONSTRATION
LOCAL MAIZE LOCAL PRACTICES
HYBRID MAIZE RECOMMENDED PRACTICES
LOCAL MAIZE RECOMMENDED PRACTICES

- **Photographs** can have many uses in a campaign, especially when the pictures are taken of people and activities in the immediate community. Almost everyone likes to see photographs of himself, his family, and his friends. Pictures taken locally have greater credibility than those taken elsewhere.


SMOOTH THE SOIL WITH A PLANK
Planking—

- **Flip charts, flannel board presentations, filmstrips or slide sets** can be used to supplement a demonstration. These media all have similar characteristics and are useful for teaching planting or harvesting techniques as well as steps in canning or preserving foods. For example, many filmstrips have been made by photographing the pages of a good flip chart or the steps in a flannel board presentation. Which to use depends on the audience as well as the availability of materials.
- **Leaflets** are useful supplements to demonstrations. The audience can keep them as a constant reminder of details of the techniques that have been taught. If illustrations are made carefully and captions are minimized, even illiterate audiences can understand and remember them after a demonstration.

- **Characterizations,** such as the previously mentioned Mr. Good Farmer and Mr. Bad Farmer, could be adapted to compare Mr. Wise Spender with Mr. Foolish Spender.
- **Village market days** can become an integral part of a campaign. One person concerned with developing cooperatives took pictures of leather workers at a government sponsored co-op, shoppers in a co-op store, and participants in a co-op loan program. These pictures were enlarged, mounted on heavy cardboard for protection, and attached to a rope display that served as an informative and decorative background for a display of co-op projects.



- **Flannel board presentations** were used by one co-op worker who was concerned with the problems of lending money to farmers for the purchase of seed and fertilizer. Stories were written about the evils of the money lender and the advantages of borrowing needed capital from the co-op. Figures in bright colors on thin cardboard illustrated the story. Presentations were made to many groups and the response was always enthusiastic. To supplement these flannel board presentations, silk-screened posters were placed in prominent locations in the village to remind villagers of the services of their co-op. In addition, leaflets repeating the basic story were duplicated and distributed.

No matter what techniques are used in a campaign, evaluation should be conducted for each step. Pretest materials and presentation strategies with a sample of the audience before launching the campaign in full. The questions below can be used in the pretest and the evaluation. Reassess the objectives:

Were the objectives realistic?

Were they kept in mind as the campaign progressed?

Should they have been expanded or limited?

Were they in line with audience needs?

It is particularly important to evaluate the presentations, strategy used, and the selection and organization of information. Such questions as the following might be asked:

Are more women coming to the Health Center as a result of the campaign?

Are more farmers using fertilizers now?

Could opinion leaders have been used more effectively?

Could the campaign have been made more successful had someone from the Health Office participated?

Which presentations seemed to be most successful?

Should an alternate strategy have been tried when one particular strategy failed?

Could other organizations of the various media and presentations have been used?

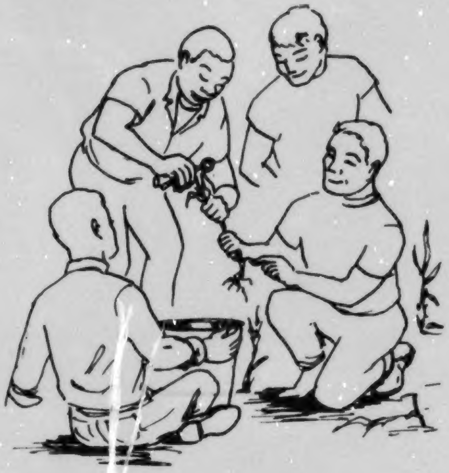
If you were putting on this campaign again, what would you do differently?

Asking questions such as those above and finding answers, even partial ones, will provide a basis for improving future efforts. Involve co-workers in the evaluation and encourage them to evaluate their own efforts in the campaign.

DEMONSTRATIONS

One of the best ways to communicate information of a "how-to-do-it" nature to children or adults is by a good demonstration. Demonstrations can range from showing simple skills such as hammering nails, sawing a board or planting a seed to those showing more complicated, detailed skills like caring for a baby or contour plowing a field. There are a number of points that should be kept in mind when carrying out any demonstration.

- **Follow a plan.** Select and organize the ideas to be communicated in terms of the specific audience and objectives.
- **Perform the demonstration smoothly.** Be sure all necessary demonstration materials are at hand before the demonstration is scheduled to begin. A full rehearsal is necessary to foresee possible problems.
- **Catch the audience's attention and focus it on key points.** Try using a flannel board, flip chart or chalkboard to list important points.
- **Emphasize important points.** Use supplementary visual materials or try repetition. One often-quoted rule of speechmaking that applies to demonstrations is *"Tell them what you are going to tell them; tell them; then, tell them what you told them."* Take-home leaflets are useful as reminders of important points in the demonstration.
- **Involve the audience.** Involve a member of the audience who is skilled at the activity being demonstrated. Have him carry out all or part of the demonstration. Meanwhile, describe what he is doing. Ask questions or have members of the audience repeat steps in the demonstration. Not only will this help them feel involved, but also details that might have been misunderstood can be clarified.



- **Follow-up.** Shortly after the demonstration, check to see if the audience is making use of the techniques demonstrated.

Evaluation Questions

Could all members of the audience see and hear adequately?

Could the demonstration have been improved by a different organization? by slower pacing? by additional emphasis of important points?

Was sufficient attention paid to the slower learners?

FIELD TRIPS

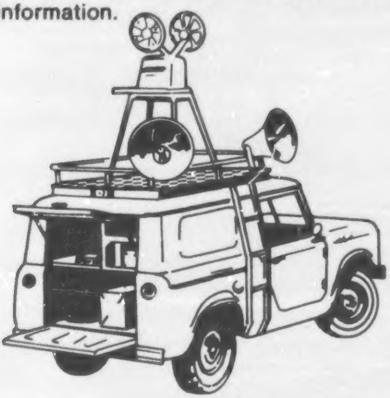
Visits to a farm, a factory, a hospital, a museum or other points of interest can contribute greatly to a child's education. Similarly, field trips can be useful with adults to show them a particularly well-organized poultry farm or to demonstrate contour plowing or an effective fishing technique. With children or adults, these points should be kept in mind when planning a trip:

- **Make a preliminary survey.** Determine whether the field trip is feasible and if it can help meet the objectives.
- **Arrange logistics in advance.** This includes planning for transport and food if necessary as well as arranging with authorities at the destination. Use a checklist for details, such as the one given on Page 4.
- **Determine a schedule.** Everyone concerned must know how, when and where in terms of departure, destination, and return.
- **Prepare the audience.** Before going on a field trip each member of the class or group should know why the trip is taking place and what is to be observed. Knowing what to look for will help focus attention on important points.
- **Follow-up.** After the trip ask yourself and members of the audience questions such as these: Did the trip serve the purpose? What was learned? Was there adequate time? Did the audience maintain interest?

MOBILE UNITS

A mobile unit is an especially designed vehicle equipped with a generator and a variety of projection and sound equipment. Mobile units can take the presentation to the audience. Showing a slide set, filmstrip or film in a village where electricity is not available will not only attract the villagers, but also many people from the surrounding countryside will come to see what is going on—a wonderful opportunity to communicate information relating to agriculture, health or community development. It is particularly important to remember that the materials shown must be appropriate to the audience's level.

In the city, mobile units can be equally valuable for carrying information to people about health clinics, literacy programs, clean-up campaigns or family planning. Mobile units are seldom readily available, but don't overlook the possibility of borrowing one for special purposes from a ministry of agriculture or health or even tying in with regular presentations by the ministry of information.



EXHIBITS

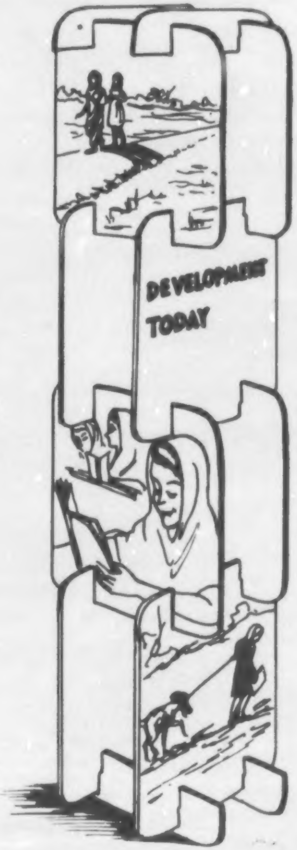
A good exhibit is a combination of many media in the best country-fair tradition. It may contain a bulletin board, an automated slide show, and a stack of handout pamphlets. It may combine real objects with models, photographs, and a tape recording. It may even include someone who acts as barker and salesman.

Whether grand or modest, the exhibit is always something special, something more than the everyday display. The exhibit is appropriate at festive occasions and special market days when people come from miles around.

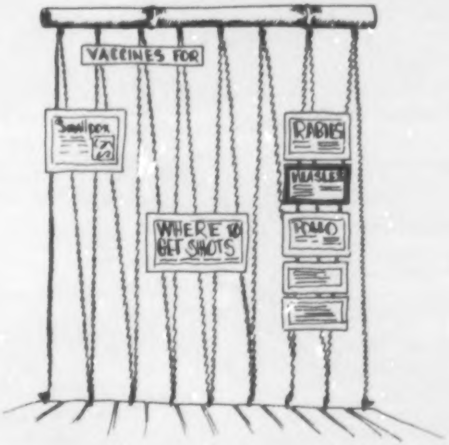
Exhibit materials can be displayed on tables, or a variety of eye-catching exhibit panels can be made with poles and plywood or grass matting. When available at a reasonable cost, pegboard panels can be used to make a variety of arresting displays. Cut the board in the shape of a map or pleasing irregular form. The holes make attaching a variety of materials easy, including many that would be too heavy to attach to a mat or to wallboard.

Heavy string, wire, plastic clothesline or fishnet can be used for display backgrounds. Another useful display background is heavy wire screening with a two-inch mesh, sold in many places as a window covering for protection against intruders. Choose a background that is appropriate to the subject and audience.

Large pictures can be displayed by mounting them on heavy cardboard or masonite. Slots are cut in the mounts so they can be assembled to form an interesting display. These can be disassembled for transport or storage.



Rope displays are effective and easily built. Stretch the rope from floor to ceiling as shown in the illustration. Fasten the rope to the ceiling with small hooks or nails. Pictures mounted on cardboard or three-dimensional objects can be taped or pinned to the rope. An exceptionally effective display was produced for an outdoor exhibit on cooperatives. Rope was combined with the palm-covered, bamboo-framed booth. The rope was looped around the bamboo frame at the top, and a bamboo pole was inserted through the loops at the bottom of the pole so that it hung about two feet above the ground. Pamphlets and photographs were attached to the rope with tape. The result—an attention-attracting display.



The following suggestions can help when planning an exhibit:

- **Use of multi-media approach.** Each of several different media can contribute to meeting objectives, for example: a display of photographs to attract attention; a simple demonstration to present information; a bulletin board to summarize the main points of the demonstration; leaflets to hand out for a "take-home" reminder.
- **Publicize the exhibit.** Use posters or space in a wall newspaper to let the intended audience know where and when the exhibit will be held.
- **Involve local people.** Use co-workers or students to help plan and build the exhibit. Have them present to answer questions. Ask them to make a mental note of these questions which can serve as guidelines for the design of future exhibits.
- **Select a suitable location.** No exhibit will communicate unless the audience can see it.
- **Attract and hold the attention of the audience.** An exhibit loses its educational value when the audience views it only in passing. To attract attention, use bright colors, an unusual format, large pictures or a catchy slogan. To hold attention, the exhibit must relate to the audience's needs. It should say: **This is an answer to your problem,** or **This will save you money,** or **This will improve your child's health.**
- **Keep it simple.** Use one central idea organized so that it is easily understood. Use few words and place key illustrations or objects where they will be seen.

Suggested Applications

To display eggs, leather goods or clothing produced by cooperative workers.

To show the values of eating protein. Large photographs or drawings can be used to compare the growth of children suffering from malnutrition with that of children who have had an adequate diet. Display samples of protein-rich foods, and distribute leaflets that contain recipes for inexpensive, protein-rich foods.

To promote the use of fertilizers. Display samples of crops grown with and without fertilizer to point out the economic advantages of using fertilizers. Slides comparing fertilized and unfertilized plots at different stages of growth can be used as an attention-getting device.

To demonstrate methods of cooking fish. Girls from a local youth club can take turns preparing fish in various ways and can hand out small samples to exhibit visitors.

To arouse children's interest in the world around them. Arrange exhibits of leaves, feathers, shells and flowers in the classroom. Involving students in an on-going activity helps them learn by doing.

Evaluation Questions

Who looked at the exhibit? Were they young or old? Male or female?

What specific items attracted their attention?

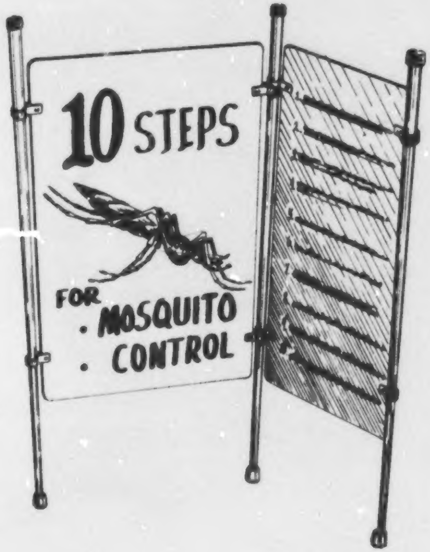
What other exhibits did they visit?

What did they remember about the exhibit a month later?

Did they keep the leaflets that were handed out?

Did they use the leaflets?

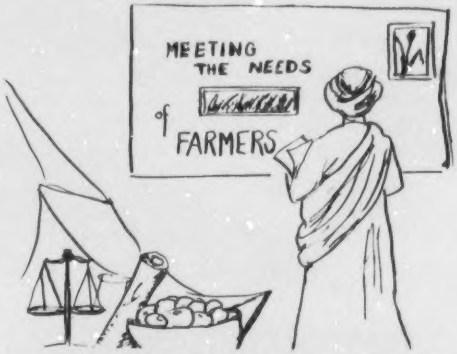
Evaluation of exhibits is particularly important because they involve considerable time in planning and production. Exhibits provide a fine opportunity to involve students who can assist in the evaluation by gathering data about attendance at the exhibit.



PRESENTATION BOARDS

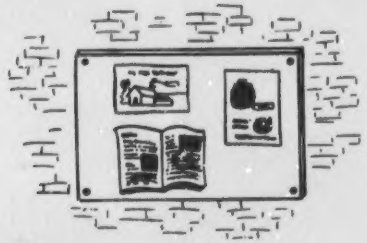
There are several different types of presentation boards that can be used to supplement a lecture or demonstration. These include bulletin boards, chalkboards, electric boards, flannel boards, magnetic boards, and plastigraphs. When using any of these, a few basic ideas should be kept in mind.

- Base the selection of a presentation board on the audience, the goals, the content being presented, and available materials.
- Choose and organize content in terms of audience and goals.


MEETING THE NEEDS of FARMERS

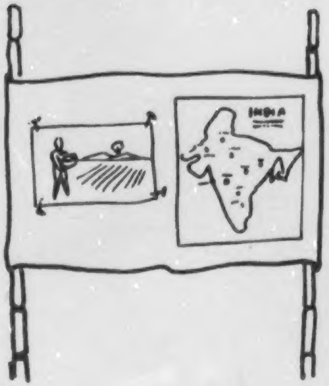
- Use one idea, presented in a simple, straightforward manner.
- Attract and hold the attention of an audience by using basic principles of color and design to combine good, neatly-mounted illustrations with legible lettering.
- Evaluate effectiveness by asking appropriate questions relating to planning, production, and use.

Bulletin Boards

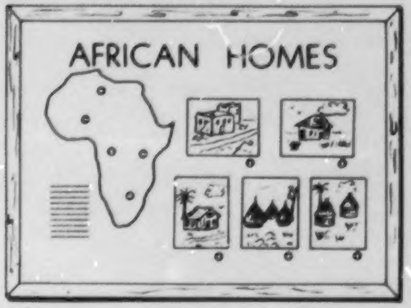


One of the most common types of presentation boards is the bulletin board which can be:

wallboard, plywood, or hardboard
pegboard
the wall of a building
a blanket stretched tautly between two trees
a banana leaf or a grass mat tacked to a wall
heavy corrugated cardboard
wire screening.



What is chosen will depend on what is available as well as the nature of the display. A banana leaf may be fine for a temporary display, but in a classroom something more permanent is needed. A sheet of wallboard is ideal. It is lightweight and strong, and displays can easily be fastened to it.

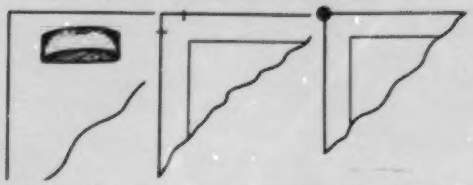


A frame of some kind usually improves the appearance of a board. While an effective frame can be constructed from wood, good results can be had by using such materials as rope, bamboo or palm fronds as frame materials.

The appearance of a bulletin board on a wall or sheet of wallboard, plywood or hardboard can be improved by painting or covering it with cloth, wallpaper, newspaper or matting. Interesting effects can be achieved by crumpling paper and smoothing it out to create a textured surface for a background. Be sure that the background is not so busy that it detracts from the display. Avoid cloth or wallpaper with conspicuous patterns.

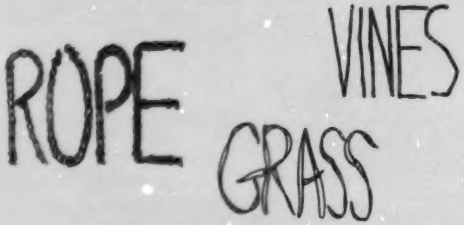
If the board is to be placed outdoors, it is best to find or make a shelter for it because sun and rain can quickly undo hours of hard work. A covering of clear plastic, if available, also protects an outdoor bulletin board.

There are many ways to fasten materials to a bulletin board—thumb tacks, push pins, bamboo splinters, thorns, staples, glue, tape or straight pins. One of the most satisfactory methods is straight pins because they are inconspicuous and easily removed without damaging the board or display elements. Tape loops, with the sticky side out, are good for holding pictures and other lightweight materials, but tend to lose their grip in a day or two, particularly in hot, humid weather.



Bulletin boards can be made effective in many ways.

- **Choose a location where the board will be seen.** In the community this might be in the market place, by the post office, or near a well-travelled path. In the classroom it might be above a work table or opposite the doorway so the students see it as they enter the room. No matter what the location, it should be placed at a height that is appropriate to the viewers, and there should be adequate light so it can be easily seen.
- **Keep the bulletin board neat and clean.** If used for announcements, remove old materials promptly.
- **Use a variety of techniques to attract attention.** Extend some display elements out from the board. This can be done by mounting a picture or object on a small box and then attaching the box to the board. Extend titles beyond the boundaries of the board, thus pulling the viewer's eye into the main display. In addition to pictures, try displaying real objects. A few stalks of rice, a syringe, a specimen or a swatch of cloth will add appeal and credibility to displays on agriculture, public health or home economics. Real objects create interest, and the message is likely to be remembered longer.
- **Use a variety of lettering techniques.** Letters can be cut out of paper, cloth, cardboard, or wood. Yarn, rope, grasses, vines, and wire can also be used as effective lettering materials. Be sure there is sufficient contrast between letters and background to maintain good legibility.



- **Involve the audience.** Displays can ask questions that relate to the needs of the audience. Handout leaflets can be a part of a display.

Suggested Applications

To announce film showings, demonstrations, visits by doctors or extension workers.

To remind people to get an inoculation, spray their house, weed their crops, etc.

To display posters, charts, wall newspapers.

To display photographs of local activities.

To make comparisons. For example, a display of two ears of corn—one from a fertilized field, one from an unfertilized field—or photographs of well-fed and poorly-fed children.

To display pictures of projects in other places that are of local interest.

To introduce a new topic in the classroom.

To provide a reminder of topics that have been discussed.

To display student work.

To provide supplementary information.

To announce various events.

Evaluation Questions

Always try to get some measure of the effectiveness of a bulletin board. There are many questions that can be asked.

What percentage of the people passing a display stopped to look?

Who stopped to look?

What could have been done to attract more attention?

How long did people look at the display?

Was the lettering legible?

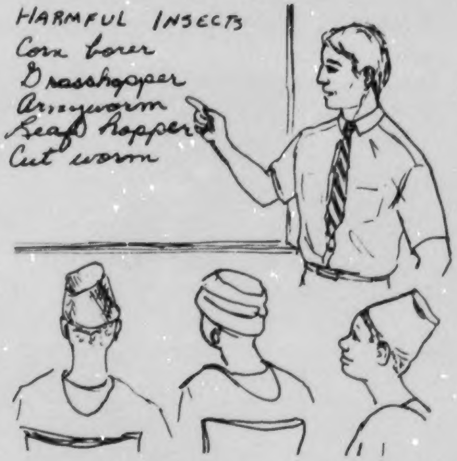
Was the message easily understood?

Chalkboards

The best-known and most easily-used presentation board is the chalkboard. If a ready-made chalkboard is not available, one can be made by painting a smooth piece of plywood with blackboard paint or any flat, dark-colored paint. Careful sanding of the board before painting will pay off in appearance and writing ease. Small portable chalkboards can be made of painted hardboard or a piece of oilcloth. Rub the smooth side of the oilcloth lightly with fine sandpaper so that it will accept the paint. Stitch the bottom and the top to bamboo sticks, and the chalkboard can be rolled up for easy carrying. By covering the back of a chalkboard with flannel a combination chalkboard-flannel board can be made that is very useful for extension workers in the field. Before writing on a new chalkboard for the first time, be sure to wipe it all over with a cloth or eraser covered with chalk dust. This will make subsequent erasing easier.

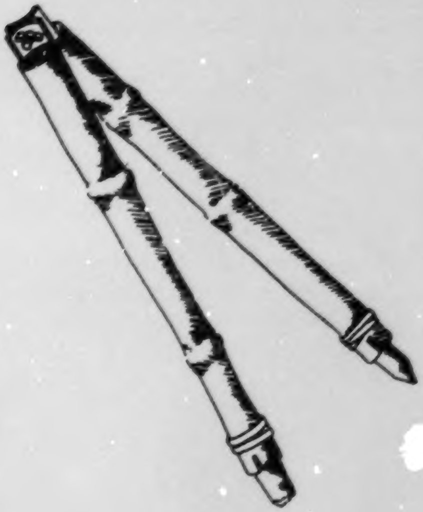
Chalkboard presentations can be improved by following a few guidelines.

- **Always plan carefully.** Know what will be put on the board in order to plan for the use of space. Lightly sketching material on the board in advance can sometimes be helpful.
- **Make writing and illustrations neat and legible.** Use an easily-read writing style and be sure that the chalk contrasts with the board. A clean board is essential. Erase carefully with vertical strokes and wash occasionally.
- **Don't talk while writing on the board.**

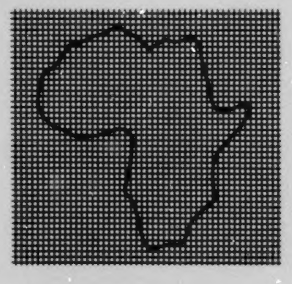


- **Don't stand in front of material that the audience should be able to see.**
- **Don't put too much on the board.** If it is necessary to put a large quantity of material on the board, do it in advance of the presentation. To avoid distracting the audience, such materials can be covered with sheets of paper which are removed as necessary.
- **Be sure that the audience can see.** This is more than legible writing and clear illustrations. There should be adequate lighting and a minimum of glare.
- **Use color for emphasis.** Light colors are generally more legible than dark colors. If chalk is difficult to obtain, make your own. One method is described in Appendix 4.

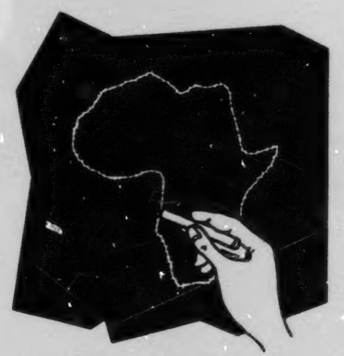
- **For making accurate geometric shapes,** use cardboard templates. Circles can be made by using a piece of string with a loop in one end to hold the chalk or with a bamboo compass. To make a bamboo compass:
  1. Cut two bamboo rods about ½ inch in diameter and 16 inches long.
  2. Make a slit ⅛ inch wide and one inch deep in the end of one rod. Chalk is held in this end by clamping it with a strong elastic band.
  3. Fit a sharpened wooden peg snugly into one end of the rod.
  4. Cut one-inch notches at the other ends of the rods leaving only ¼ of the circumference. Drill holes in these ends and fasten them together with a bolt and wing nut.



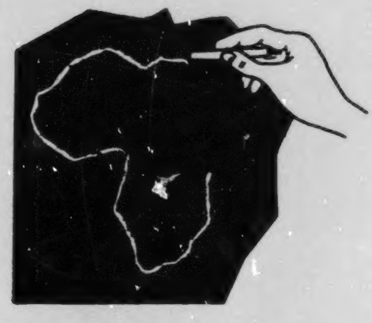
- **Drawing complicated illustrations** that have to be used on numerous occasions can be simplified by using the screening technique. Follow these directions:
  1. Stretch a piece of mosquito netting on a frame. Using a brush and thin paint, a crayon or a felt point pen, make the drawing on the screen. It is easier if the drawing is made on paper first, then traced onto the screen.



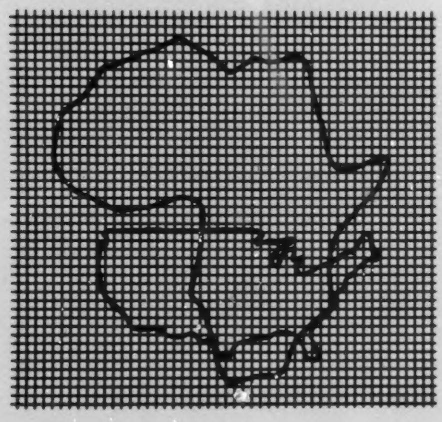
  2. Place the screen against the chalkboard and draw over the painted lines with chalk.



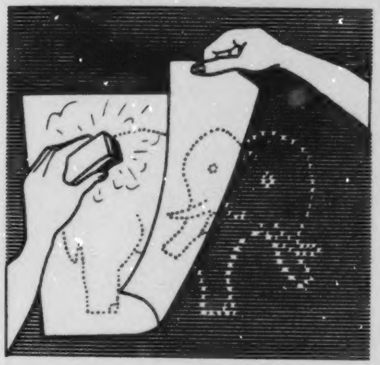
  3. Remove the screen and go over the lines with chalk to make them stand out.



By using several colors of paint, several outlines can be made on the same screen which can be used indefinitely.



- **Dot-dusting techniques** can also be used for making complicated drawings by following these steps:
  1. On a large sheet of heavy paper make a careful line drawing as it should appear on the board.
  2. With a large needle make small holes along the lines of the drawing about an inch apart.
  3. Before the audience arrives, place the paper against the chalkboard and pat a dusty eraser against it. A dotted outline will be transferred to the board which can be completed immediately or during the presentation.



Suggested Applications

To summarize the key words of an oral presentation.

To list the steps in a process (also might be repeated in a leaflet to be given to the audience).

To list ideas suggested by the audience when planning group projects. This helps them to feel involved.

To list audience responses to questions. For example, to list the foods in different food groups.

To work out weekly or monthly plans.

To list assignments.

To provide student demonstration and drill in arithmetic. Using the chalkboard allows the teacher to watch several children at the same time and often uncovers problems that would go unnoticed if the child stayed at his desk.

To develop a story point by point.

To locate cities, rivers, mountains or other features on a map. The chalkboard is particularly useful for this purpose where maps are scarce.

To present new words or terms.

To visualize information graphically through the use of various kinds of graphic presentations. Pie charts, line charts and bar charts are particularly adaptable to chalkboard presentation.

Evaluation Questions

Was the material to be presented carefully organized in a logical manner with sufficient repetition and emphasis of important points?

Was all material on the board neat, legible, and easily understood?

How could the presentation have been improved?

Was the chalkboard the most appropriate medium to use?

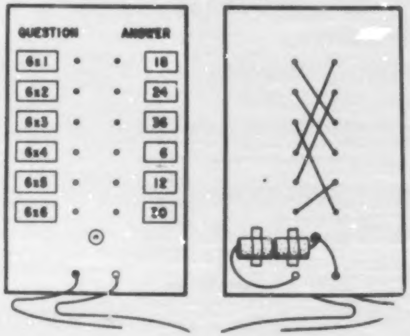
Electric Boards

An electric board is designed for audience participation, and is primarily suitable for classroom use or for use as part of a display at an agricultural or health show. In its simplest form there is a list of questions and a list of answers with an electrical contact beside each. To use, the viewer touches a wire to the contact beside a question and a second wire to the contact beside the answer he thinks is correct. If correct, an electrical circuit is completed and a light turns on or a buzzer sounds.

To make a simple electric board, proceed as follows:

1. Gather these materials—
   an appropriate sized piece of plywood, hardboard or heavy cardboard for the backing
   nuts and bolts or split paper fasteners for the electrical contacts
   heavy paper or cord for the questions and answers
   single strand electrical wire
   a flashlight bulb
   two flashlight batteries.
2. Mark out the areas for the questions and the answers on the board. Questions can be lettered on paper or cardboard and glued in place, or slots can be easily changed.
3. Drill or punch a small hole adjacent to each question and each answer, and put a paper fastener or a bolt through each hole for a contact. Drill two holes for the connecting wires and one for the bulb.

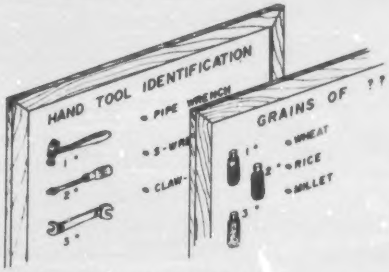
4. On the back of the board, connect the contact beside each question to the contact beside the correct answer to that question. Connect the batteries and bulb as shown. Leave the lead wire long enough to reach each of the questions and answers. Batteries can be taped to the board, and wires can be taped to the proper terminals; however, to avoid problems with bad connections, use a bulb socket and a battery holder and solder connections. Nails can be soldered to the end of the lead wires to make them easier to use. Ingenious ways of construction can be devised by using parts of an old flashlight. To prolong the life of batteries, be sure lead wires do not touch when the board is not in use.



To make your electric board effective:

- **Choose a suitable location.** Not only must the electric board be seen, but it must also be in a place that is convenient for people to use it.

- **Try variations of the basic board.** Make a board in an unusual eye-catching shape. Use a colored light or three-dimensional materials. Incorporate the light into the design of the board—a star could light up when the correct contacts are touched.



Suggested Applications

To relate authors with the books they have written.

To help children learn the locations of countries or the names of capital cities.

To add variety to arithmetic drill.

To identify bones or other parts of the body.

To relate specific foods to the food groupings in which they belong.

To associate animals with the products they provide.

Evaluation Questions

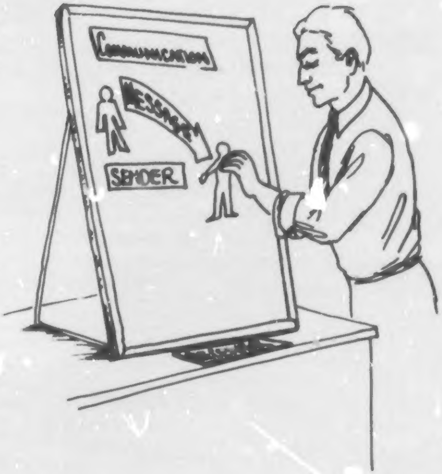
Does the electric board attract attention?

Does the novelty of the board detract from the message it is intended to commmunicate?

Would some other medium have been equally effective with less effort?

Can the questions and answers be changed conveniently?

Flannel Boards



The flannel board can be useful in conjunction with an oral presentation. Items can be placed on the board progressively to tell a story or to keep the audience aware of the main points in a talk. The construction of a flannel board or felt board is simple.

1. Cut a piece of plywood, wallboard, hardboard or heavy cardboard to the appropriate size. For audiences up to 100 persons, a 3 x 3 foot board is about right.
2. Stretch a piece of rough-surfaced cloth, such as flannel, felt, wool, raw silk or burlap, over the board, and fasten it securely in place with tape, staples or thumb tacks. A rough-weave blanket in a dark, neutral color is ideal and usually is readily available at minimal cost.

A wide variety of materials will adhere readily to such a board. These include:

Cloth cutouts
Pieces of yarn or string
Blotting paper
Thin strips of rough-surfaced, light wood
Cardboard strips backed with a piece of rough cloth or coarse sandpaper. If sandpaper is not available, spread some glue on the back of the cardboard. Before the glue dries, sprinkle it with sand.
Photographs or other illustrations can be backed in the same manner as cardboard strips.

When using a flannel board, keep a few simple ideas in mind:

- **Lean the flannel board back slightly when in use.** Materials are less likely to fall off.
- **Avoid windy locations.** Materials may blow off the board.
- **Carefully plan the steps of the presentation.** Making rough sketches of the final board can help in the design of more effective materials.
- **Rehearse the presentation in advance.** This will give time to make necessary changes.
- **Stand beside the board, not in front of it.** The audience should be able to see it at all times.
- **Consider legibility.** Be sure that all words and illustrations are large enough to be seen and simple enough to be understood by the audience.
- **Leave items on the board** only as long as they are needed.
- **Avoid excessive handling.** It distracts the audience.

After a classroom presentation, a flannel board can be displayed in another part of the room to serve as a reminder of the lesson.

Suggested Applications

To show the relationships of parts of geometric figures.

To teach vocabulary by relating words to pictures of various objects. Children can actively participate by choosing the proper words and placing them by the pictures they represent.

To stimulate participation in drills on word endings or arithmetic problems.

To illustrate a children's story.

To illustrate chemical structures.

To list the steps in a demonstration.

To illustrate a story or a process as it is being explained.

Evaluation Questions

Was the flannel board relevant?

Was the material organized logically in a way the audience could understand?

Was the presentation smooth? If not, why not?

Were all words on the board legible?

Did the flannel board presentation help meet the objectives?

Magnetic Boards

Magnetic boards serve the same function as flannel boards. The only difference between the two is the adherence method. The magnetic board is usually a thin sheet of iron. Display items have small magnets fastened to them with glue, tape or wax. The board should be painted to improve its appearance and to prevent rusting. The paint will not appreciably affect the magnetic attraction. Magnetic boards can also be made by stretching a piece of ironwire screening on a piece of plywood or on a wooden frame. In the latter method the display items seem to hang in mid-air.

Because magnets are a bit difficult to find, the magnetic board is less practical than a flannel board; however, it can be very useful when display items are heavy or when presentations must be given in windy places. It should be noted here that new hook and loop materials are available in some places and have similar advantages.

Plastigraphs

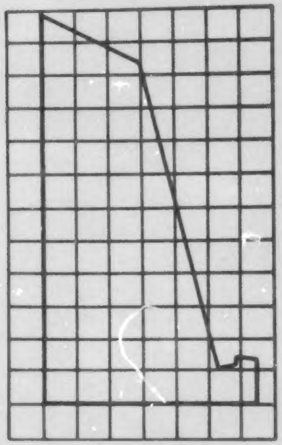
The plastigraph is similar to the flannel board except for the board covering and the materials to be used on it. These materials are cut from sheets of polyvinyl chloride, a thin, flexible plastic often used for tablecloths. Polyvinyl-chloride materials stick to glass or other smooth surfaces and are available in many brilliant colors. They are particularly adaptable for teaching children the basic concepts of color, shape, size, and number.

Stands for Presentation Boards

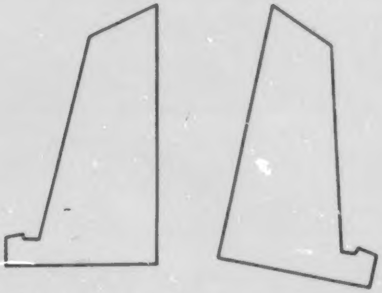
Frequently, a bulletin board, a flannel board or similar materials need to be displayed in front of a group where there is no convenient wall or tree on which to place the board. Several kinds of display stands can be made.

A simple cardboard easel is ideal for holding pictures mounted on cardboard or in tape-framed mounts. Materials needed are a piece of scrap cardboard and some paper or cloth tape. Use the pattern shown as a basis for making an easel the needed size. If the easel is to be twelve inches high, use two pieces of cardboard about 6½" x 12". Steps for making the easel are:

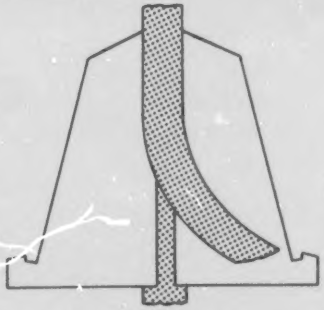
1. Draw the outlines of the easel on cardboard. An easy way of transferring this pattern to cardboard is the squaring method.



2. Cut the cardboard with a sharp knife or razor blade.



3. Place the pieces of cardboard about ¼" apart as shown and tape them together over the space. Turn the cardboards over and tape on the other side. Trim the excess tape and the easel is ready to use.

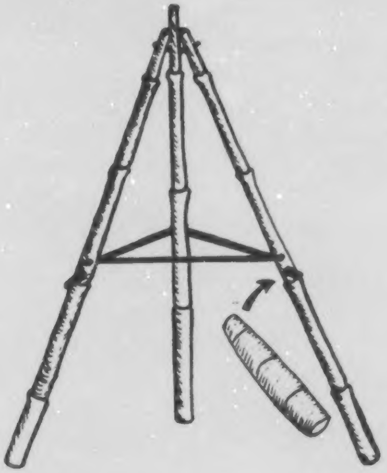


Painting the cardboard makes a fancier easel. To hold flannel boards or bulletin boards, larger versions of this type of easel can be made from thin plywood or hardboard (masonite). Use cloth tape for the hinged joint, as paper tape will tear with use.

A tripod easel can be constructed to hold a flannel board or flip chart. Materials needed are three pieces of bamboo about five feet long, a couple of wooden pegs, and some heavy cord.

1. Drill a hole near one end of each pole and tie the three pieces together securely, but not so tightly that the tripod legs cannot be folded together.
2. Drill another hole near the center of each pole and tie a four-foot piece of cord through these holes to form a triangular support.
3. Drill two additional holes at a convenient height and insert wooden pegs to support a flannel board or similar materials.

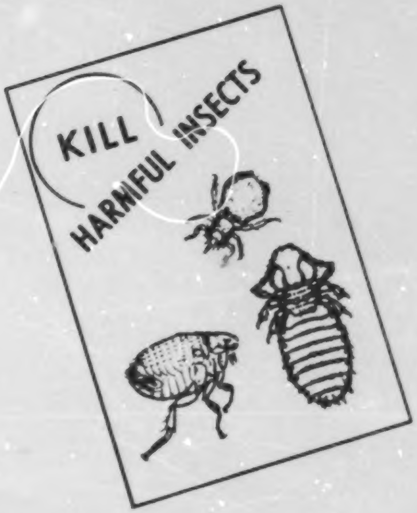
A stand of this kind is sturdy, easy to build, costs very little, and is convenient to carry and to use.



OTHER PRESENTATION MEDIA

Printed materials can range from a simple silk-screened poster to an elaborate book. Seven relatively simple materials will be considered here. These are charts, posters, pictures, flash cards, maps, leaflets and pamphlets, and wall newspapers. When making and using any of these materials for use in the classroom or in the community, several basic ideas should be kept in mind.

- Base the selection of media on its suitability to the subject matter being communicated, the specific audience, and the resources available.
- Design materials so that they will attract the attention of the audience.
- Keep all materials simple. Avoid words or illustrations that do not contribute to the message.



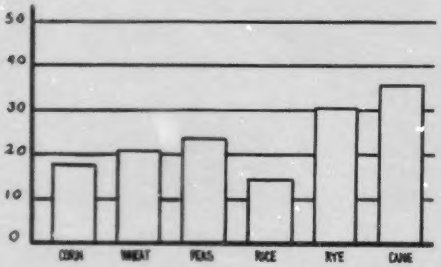
- Pretest materials whenever possible. This is particularly important when making printed materials that may reach many people. Testing even a rough prototype leaflet or poster with a small sample of the audience can determine whether the words and illustrations are readily understood. In addition, factual errors are often detected.

Charts

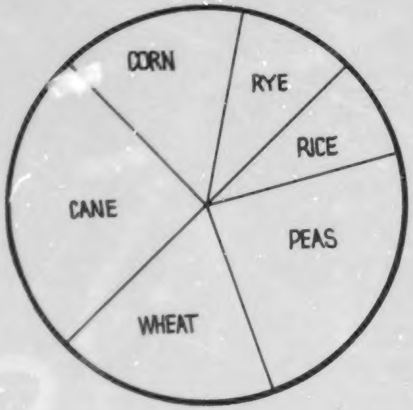
Pictorial and graphic charts are among the most useful visual materials. Presented during a discussion, they can clarify difficult concepts and emphasize important points. Commercial charts are available on many subjects, or charts can be hand drawn and lettered on light-colored cloth, cardboard or heavy paper such as cement bag paper. If multiple copies are needed, they can be silk screened or printed.

Paper charts can be mounted on cloth by the wet mounting method to increase their durability. Charts can be divided into several major categories.

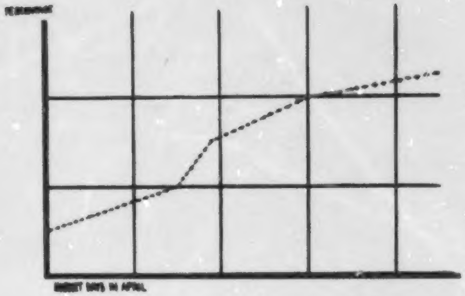
- **Bar charts** indicate relative quantities by a series of vertical or horizontal bars and are good for showing changes over a period of time. When making a bar chart, use only essential information and be particularly careful with layout. The bars should not crowd the edges and the space between bars should be about half the width of a bar. Shading or coloring the bars will add emphasis. Such charts should be used only with sophisticated audiences.



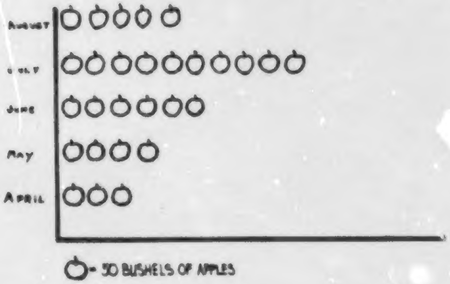
- **Pie charts** show the relationship between a whole and its parts, such as the relationship between single crop and total crop production, or between various budget categories and a total budget. To maintain clarity, slice the pie into no more than six or seven pieces. Add emphasis and separate different items by using colors.



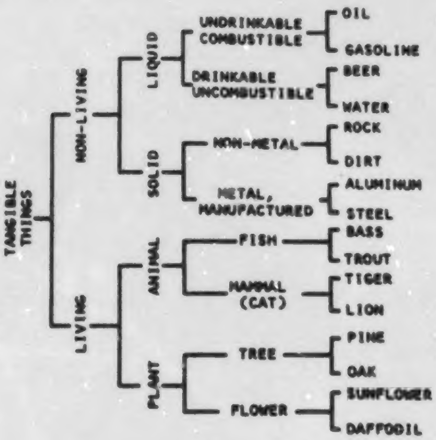
- **Line charts** show trends by using a line that indicates relationships between two factors such as sales and time or growth and time. Several bits of data can be handled on one chart by using solid lines, dashed lines and dotted lines, or colored lines can be used. Too much information can be confusing so keep charts simple.



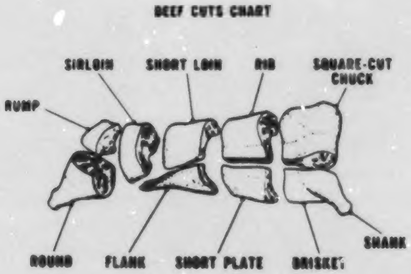
- **Pictorial charts** use symbols to indicate quantities and are good for comparing population data, outputs of different crops or production of various manufactured products. Always check the meaning of the symbols with a sampling of the audience to be sure they are understood.



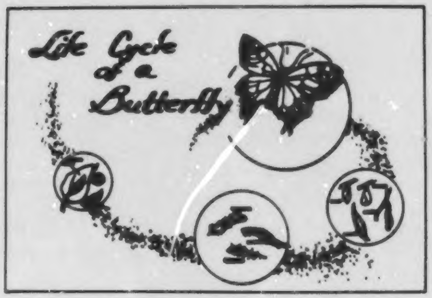
- **Flow charts** combine boxes or drawings with lines and captions to show sequences or processes such as life cycles or administrative structures. Such charts can form the structure for an entire talk, supplemented by charts explaining each step in the basic flow chart. Avoid complicated diagrams that will confuse the audience. It is better to break a complicated chart into two or more simple ones.


TANGIBLE THINGS
NON-LIVING
LIQUID
UNDRINKABLE COMBUSTIBLE
OIL
GASOLINE
DRINKABLE UNCOMBUSTIBLE
BEER
WATER
SOLID
NON-METAL
ROCK
DIRT
METAL, MANUFACTURED
ALUMINUM
STEEL
LIVING
ANIMAL
FISH
BASS
TROUT
MAMMAL (CAT)
TIGER
LION
PLANT
TREE
PINE
OAK
FLOWER
SUNFLOWER
DAFFODIL

- **Illustrative charts** are pictures or diagrams that may or may not be accompanied by verbal descriptions. Illustrative charts can be made to serve many purposes. Complicated charts can be displayed on a wall or bulletin board so they can be studied at leisure. If charts are to be used with a class or large audience, keep the illustrations simple and the lettering large enough to be easily read at a distance.


BEEF CUTS CHART
SIRLOIN
SHORT LOIN
RIB
SQUARE-CUT CHUCK
RUMP
ROUND
FLANK
SHORT PLATE
BRISKET
SHANK

When making and using any chart, plan carefully. Be sure the content selected and the organization of the content is appropriate to the objectives and audience. Design each chart so that it will attract attention and present a clear, easily understood message to the audience.


Life Cycle of a Butterfly

Flip charts are simply a series of charts bound together at the top. They are used primarily to present a step-by-step sequence such as the steps in planting, the steps in cleaning fish, or the steps in bathing a baby.

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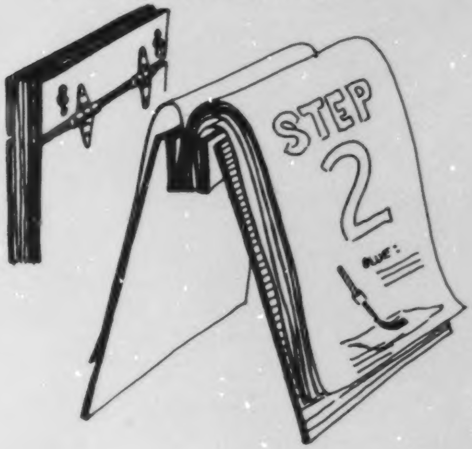
To make a flip chart that is easy to display, use a piece of plywood or hardboard the same as the charts.

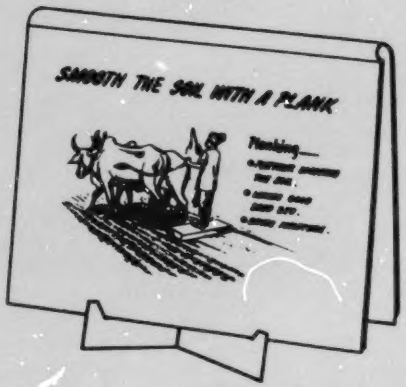
1. Drill two holes at the top of the board and two matching holes in a strip of wood.
2. Punch holes in the tops of the charts and sandwich them between the board and the strip.
3. Bind with bolts and wing nuts.

The flip chart is then ready to use. To make a self-supporting flip chart:

1. Hinge two strips to the top of two plywood boards. If hinges are not available, drill holes in the plywood and use a loop of heavy cord for a hinge.
2. Sandwich the papers between the two strips and bolt together. The plywood cover serves as a stand.
3. Fasten a string through a slot in the bottom of each board to prevent it from spreading apart while in use.



Use plain paper for pages to make a pad which can be used in much the same way as a chalkboard. Make drawings on the paper with crayons, chalk, felt pens or charcoal. The pad has the advantage of allowing the user to return to previous drawings by flipping back a few pages. Moreover, he can tear off pages to give to his audience for reference. Ordinary newspaper can be used for this purpose. Choose pages that are free of large print and photographs. Be sure to use heavy dark lines so they will be easy for the audience to see.


SMOOTH THE SOIL WITH A PLANK
Planking—

Suggested Applications

To present the steps of a process such as spraying for mosquitoes, applying fertilizer, or packing bananas ready for market.

To show what the local co-op can do for the villager.

To relate specific foods to their food groups.

To delineate the steps in a continuing cycle such as the water cycle, the oxygen-carbon dioxide cycle, or the sulphur cycle.

To compare growth rates of children with different diets.

To show examples of different parts of speech.

To compare various geometric shapes.

Evaluation Questions

Did the chart attract attention?

Was the content appropriate to the audience and the objectives?

Was the content organized in a logical, easy to understand manner?

Were the words and illustrations understood by the audience?

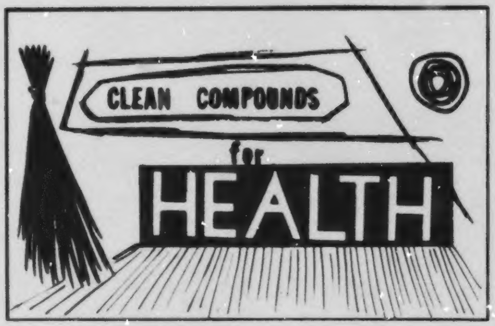
Did the chart help meet the objectives?

Posters

Posters are small signs that represent one idea simply and concisely. Posters can be used to announce coming events or to remind the audience of an earlier presentation. When planning posters, keep these ideas in mind:

- **Keep it simple.** A poster is intended to remind, not to convey a large amount of information.
- **Begin designing a poster by making several small sketches.** Select the best one, or better yet, have members of the intended audience pick the one they feel will be most effective.
- **Place posters in conspicuous places.** They must be readily seen by the intended audience. Be sure to get permission before placing posters on private property.

- **The message of the poster must be immediately apparent.** For this reason it must attract attention through a few eye-catching words and easily perceived illustrations combined in a colorful, eye-catching design.



- **When possible, use elements from other phases of a campaign in posters.** For example, a poster can repeat a visual from a chart, leaflet, or flannel board presentation. For carry-over between media, use a well-known character in a country, like the United States Forest Service's Smokey the Bear, who appears on posters, and bumper stickers and in pamphlets and films.

If only a few posters are to be made, do them by hand—an excellent opportunity to involve students or co-workers. For larger quantities, use stencils, silk screen, or offset printing. If posters are used to announce meetings at different times and places, work can be saved by printing a large number of posters with the space for the time and place of the meeting left blank. This information can be hand lettered in the space later.

Suggested Applications

To announce a campaign or a coming event.

To remind people to spray their house (or have it sprayed), fertilize their crop or clean up their village.

To remind farmers or housewives of a scheduled meeting or demonstration.

To remind children to wash their hands or brush their teeth.

Evaluation Questions

Did the poster attract attention?

How could it have been made more eye-catching?

Were there enough posters to get across the message?

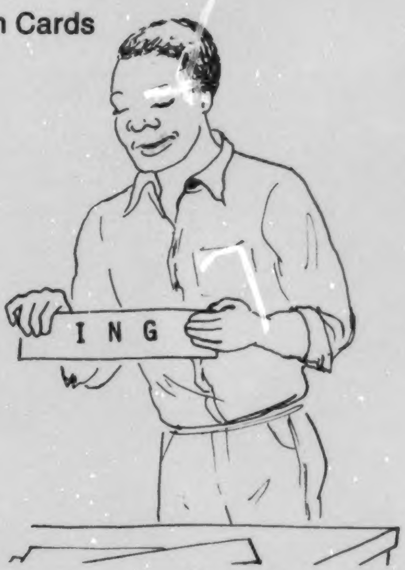
Was the poster's message clear to viewers?

Pictures

Pictures of all kinds are useful for teaching. Used in the classroom, in a health clinic, on outdoor bulletin boards or at a demonstration site, they can help to give meaning to the words used. Pictures can show things that are too large, too small or too far away to be seen first hand. They can even show things that have happened in the past.

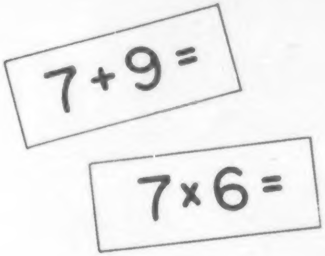
A wide variety of pictures are available to teachers and extension workers from educational supply houses, government agencies, travel bureaus, and commercial concerns. In many instances teachers and extension workers make their own pictures photographically. Inexpensive cameras are easy to use and processing is available in most towns. Some teachers have set up small darkrooms to process their own photographs. Involve students in taking and processing photographs—a worthwhile learning experience. There are many good books covering the basic steps of processing films and making prints. Most photographic dealers are eager to help in such a venture. A number of suggestions for taking, using, and evaluating pictures are given in the section on slides.

Flash Cards



Flash cards are cards on which a simple illustration is drawn or on which a few words are printed or written. Generally, they are used in the classroom for drill purposes in language studies or arithmetic. They can also be used as a spur to discussion. Cards can depict stalks of corn, each with a different disease. The discussion leader holds up a card and members of the group attempt to identify the disease and its remedy. A similar procedure might be used in training health workers with each card showing a photograph of a patient with a different visible disease symptom.

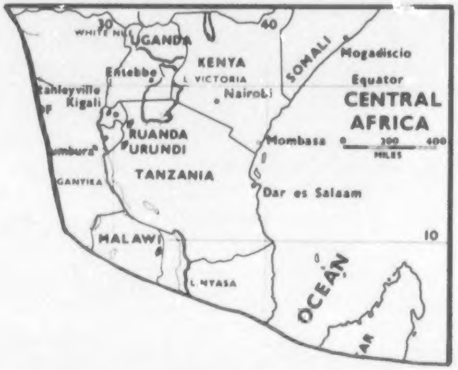
Co-workers or students can make flash cards. Use stiff cardboard or several sheets of heavy paper neatly glued together for the card. Make the lettering and the illustration large enough to be easily seen. Use color for variety and emphasis.



Large flash cards can be used on an easel; smaller ones can be held by hand. Display each card prominently and in a fixed position during use. After using, lay it aside—a cue to the audience that it is no longer the one on which attention is to be focussed.

Maps

Maps are symbolic representations of areas of the earth's surface, usually an area too large to be seen naturally. When an oil company on Guam published the first road map of the island, the response was overwhelming. A man wrote to the island paper saying, "For the first time, our children can look at a map and point out their own village and the street on which they live." Although commercially produced maps are very useful, teacher- or student-made maps can be even more effective because they can be made to contain only those details relevant to the specific teaching objective.



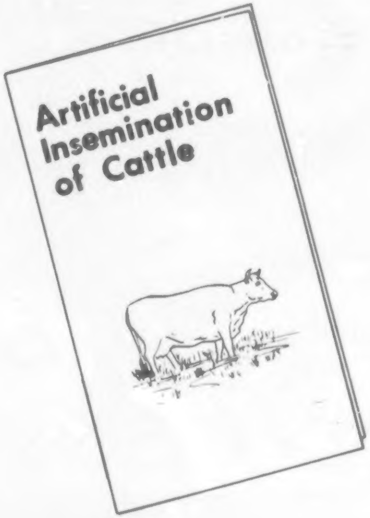
Maps for classroom or project work can be made by using thin paper to trace the relevant elements from an atlas or from a map distributed by a commercial or governmental agency. Once the original tracing has been made, the map can be reduced or enlarged to the desired size by the squaring method and transferred onto a chalkboard, a large sheet of heavy paper, or a master for hectograph duplication. Use different colors for boundaries, rivers, forested areas, etc. to add to the map's appeal and to make it more readable. Too many colors may result in confusion.

Elementary or secondary school children can be assigned the task of mapping their own village. Active participation will increase the amount and retention of their learning.

Leaflets and Pamphlets

These easily-produced materials can be invaluable for communicating with many different groups, even with illiterate audiences. There is usually someone around who can read. The important thing is to make the leaflet or booklet attractive and meaningful to the audience. There are a number of points to follow when planning and producing effective written materials.

- **Plan carefully.** Know the audience and write for that specific group. Far too many leaflets are written to impress co-workers and bosses rather than to communicate effectively. Know the goals and select and organize material appropriate to those goals.



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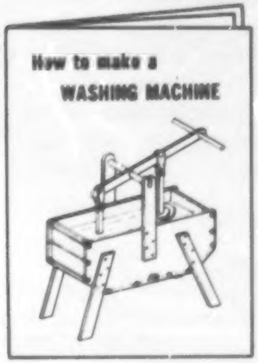
- **Attract and hold the attention of the reader.** People are attracted to a leaflet or booklet by three things:
  1. The cover. A leaflet or booklet should have qualities similar to a good poster. It should attract attention, and its message should be immediately apparent. Pretesting several cover ideas with a sampling of the audience can assure the selection of an effective design.

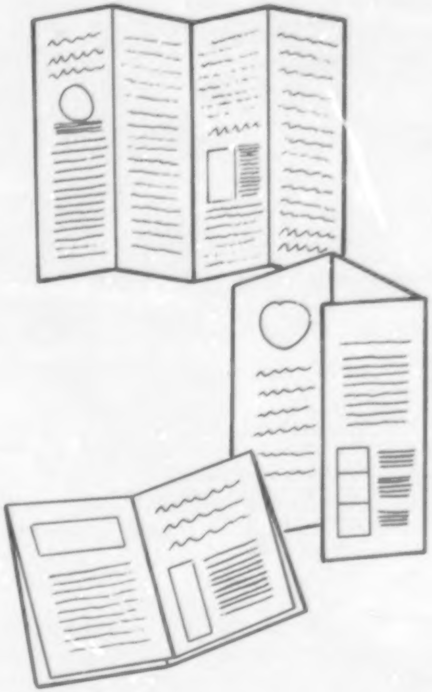


  2. The size and style of type and illustrations, and their layout on the printed page. Selecting type may be a matter of using what is available—a typewriter. If there are choices, remember that a simple type face is most legible, and a large size such as 14 point is ideal for leaflets. Type and layout can be combined in interesting ways. Use the layout suggestions given in Basic Production Techniques, Design. Most printers can suggest type choices and layout as well as assist with other production problems.
  3. The writing. Effective writing depends on several factors. Consider the audience—their needs and interests, as well as their reading level. Suggestions on organization, word choice, and sentence length and structure are included in the writing section. If the content is written humorously, be sure it is humor the audience will appreciate.

- **Be specific and accurate.** All facts should be correct and up-to-date. Even a small error will make the audience doubt the accuracy of the rest of the publication. Include all the necessary facts but don't add extraneous information that will not contribute toward meeting the objectives.

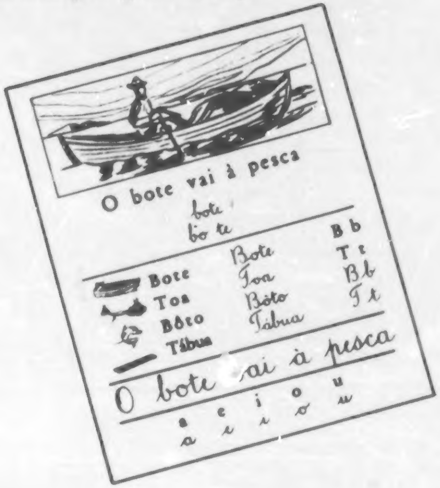
- **Consider various production possibilities.** These can range from simple hectograph duplication to elaborate multi-color printing. Each method of duplicating and printing has advantages and disadvantages, depending on the quantity of leaflets needed, the kind of type and illustrations being reproduced, the quality desired, and the budget available. Hectograph or spirit duplication is useful when fewer than 100 copies are needed and professional printing quality is not essential. Cyclostyle, or mimeograph, is useful for 100 to 1000 copies. Simple illustrations can be duplicated by either process. If high quality is important, if photographs are to be reproduced, or if large quantities are needed, offset or letterpress printing must be employed.

- **Consider distribution problems.** How will the audience get copies of the leaflet or pamphlet? If it is to be handed out after a demonstration, consider the size and shape most convenient for carrying or putting into a pocket. If it is to be sold at a bookstand, design the cover so the title will be visible in a display rack. If it is to be mailed, remember that in some countries there are mailing costs. One extra page could double this cost when quantities are being mailed.



Suggested Applications

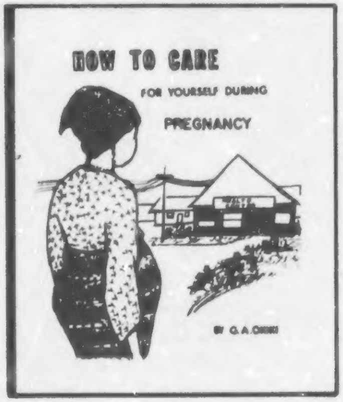
To relate literacy campaigns to the interests and activities of villagers. In one campaign, booklets that told simple stories about catching and processing fish were planned and printed. Similarly, literary materials could be developed that relate to child care, food preparation, family planning, crop marketing or grain storage.



To provide a reminder of when things should be done. One extension worker included a calendar on the back of a booklet that described procedures for planting and fertilizing. The dates for planting, weeding, and fertilizing several different crops were marked on the calendar.

To prepare test booklets covering a wide range of school subjects. For small quantities, hectograph copies can be made that are very useful in the classroom.

To motivate people to visit a health clinic or co-op market. Booklets can be written in an interesting format such as the comic strip book, *Dos Familias*. It visually showed the advantages of family planning.



To supplement a demonstration on fertilizer application, canning food, or building a latrine. A pamphlet provides a ready reference to the steps that should be followed. Clear illustrations are essential in this kind of publication.

To augment the program of a children's clinic. One doctor who had far more patients than he could handle combined a diet guide with a record of children's weight gain. Each new mother in the community received a single-fold leaflet. The front page included the title and the baby's name. The second and third pages listed and pictured foods necessary in a child's diet at various ages. The back page contained a graph on which the baby's weight was recorded by a health auxiliary during monthly visits to the clinic. If the weight fell outside the acceptable range printed on the leaflet, the child was referred to the doctor for examination. All of the mothers prized these personalized records and took excellent care of them. Very few were lost.

Evaluation Questions

Is the leaflet or booklet appropriate to the needs, interests, and literary level of the audience?

Is the material organized in such a way that it can be followed and understood?

Does the cover attract attention or could it have been improved by better design or the use of different colors?

Is the content factually correct?

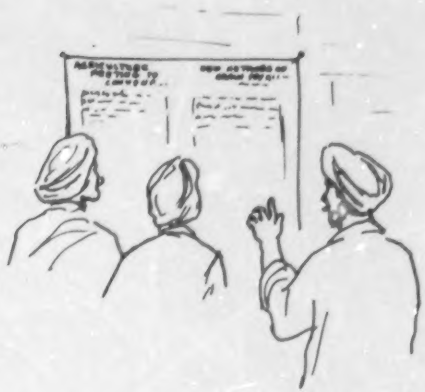
Is the writing interesting to the audience?

Do the illustrations contribute to the message being communicated?

Were the production and distribution methods appropriate?

Many other questions could be asked. Remember that pretesting materials is essential. Use an inexpensive duplicating technique to produce a few dozen copies that can be tested with a sample of the audience. Changes can then be made before starting large-scale production. A summary of checkpoints for better booklets is included in Appendix 2.

Wall Newspapers



A wall newspaper is exactly what the name implies—a newspaper that is fastened to a wall or bulletin board. It is used to communicate more detailed information than would be found on a poster or chart. Agricultural extension agents responsible for isolated areas have found them to be of great value to keep farmers aware of developments in the field. Like regular newspapers, the wall newspaper carries items of interest that may or may not pertain to the same topic. Text should be simple and direct, and large headings, photographs, and illustrations should be used freely. Since editions are usually limited, wall newspapers can be printed by the stencil duplicating process. If photographs are used, offset or letterpress printing will be necessary.

Suggested Applications

To make a progress report on a pest control program.

To announce the forthcoming visit of a nutritionist.

To provide detailed instructions for applying fertilizer.

To warn against the dangers of impure water or some insect pest that is prevalent.

To provide a follow-up article relating to a slide show or demonstration previously presented.

To present news of general interest.

To announce an agricultural show.

To provide reading material in conjunction with a literacy program.

Wall newspapers serve some of the same purposes as posters, charts, leaflets and pamphlets; therefore, evaluation criteria are similar.

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THREE-DIMENSIONAL MATERIALS

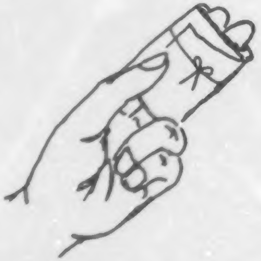
Two categories of media, primarily three-dimensional, are puppets and models.

Puppets

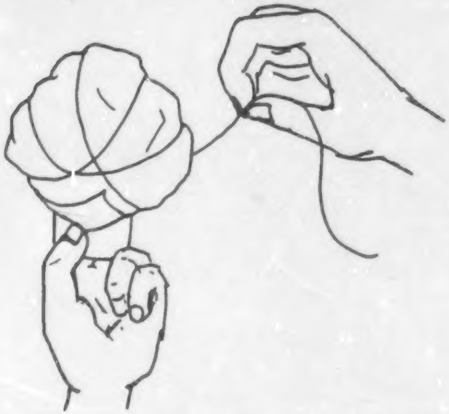
Children and adults alike are fascinated by puppets who wear local clothing and speak the vernacular of the audience. The puppet actor, being something less than human yet something more than inanimate, has great freedom to question traditional beliefs. Puppets can range from simple stick figures to complex marionettes, which will not be discussed here as they require considerable skill to make and to use.

Stick puppets are drawn on cardboard by using a simple drawing style and bright colors to attract attention. These are then cut out and mounted on a stick with glue, tape or staples. Hand puppets are more dynamic and can also be readily made. One method is described below:

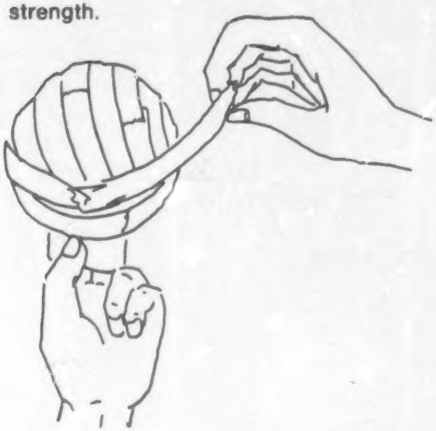
1. Cut a strip of newspaper or a piece of cardboard. Wrap around two fingers, and tape or tie securely.



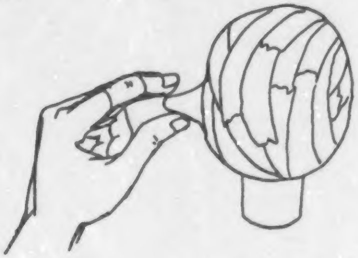
2. Crumple newspaper, wrap around fingers. Secure with several rounds of string.



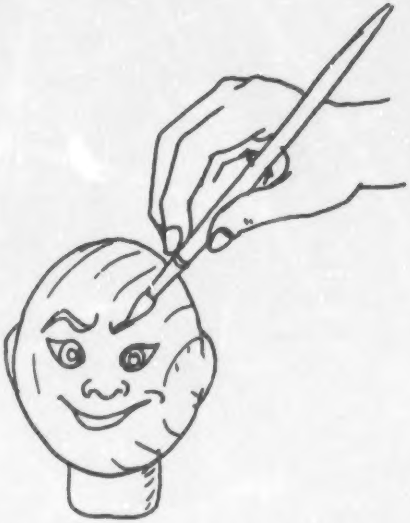
3. Mix wheat or cassava paste with water or use any other starch. Cut paper towels or newspaper in 1" strips, soak in paste, apply to newspaper "head". Add 3 to 4 layers, alternating strips horizontally and vertically to ensure added strength.



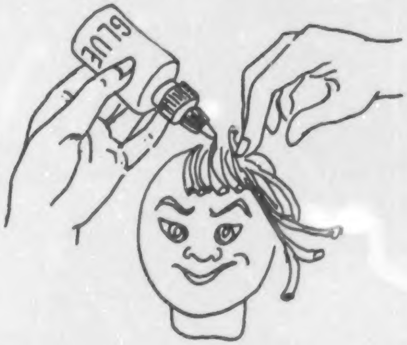
4. Add bits of paper to mold the nose and ears.



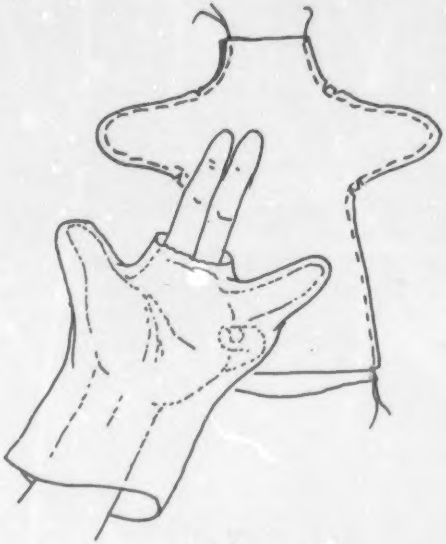
5. When very dry, paint with poster paint or tempera.



6. Glue yarn, string or real hair, or fibers from palm tree trunk to the puppet's head.

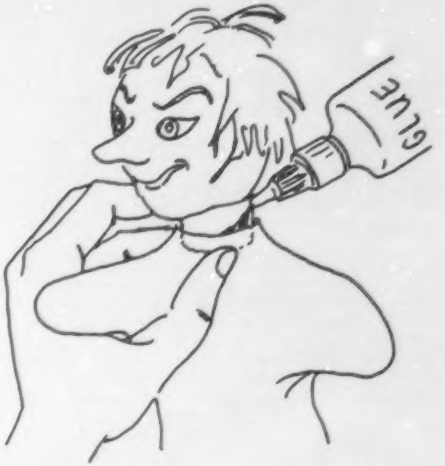


7. Place your own hand on paper and trace a pattern. Place pattern on cloth and cut double thickness. Sew the two pieces together. Turn inside out(seams on inside). Hands are optional for a puppet.



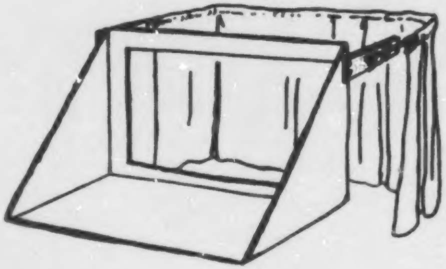
8. Glue the cloth to the newsprint neck of the puppet. Hold cloth firmly to the neck until the glue has set.

   An even simpler puppet costume can be made by cutting a finger hole in the center of a piece of cloth the size of a large handkerchief. In use, the cloth drapes over the hand.



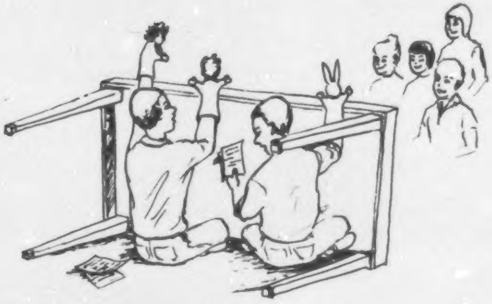
A satisfactory puppet stage can be made by tipping a small table on its side or by covering the lower half of a doorway with cloth and using the top half as a stage. A good stage, useful in many different situations, can be made with a cardboard carton, a clothes hanger, and a piece of cloth.

1. Cut the carton in half, diagonally. Cut a hole for the stage in one end. Paint this with tempera or poster paint.
2. Attach a lightweight wood or cardboard support to the top of the stage.
3. Bend a wire clothes hanger to make a curtain rod. Staple, tape or tie the ends to the support.
4. Pin or sew a piece of plain dark cloth (preferably material that is thin or loosely woven, enabling the puppeteer to see through it) to the curtain rod.



Consider the following points when making and using puppets:

- **Make puppets that are appropriate to your audience.** Keep the figures simple so that the characters are readily recognized. Dress them in local costumes and give them familiar names. Check appropriateness of names and dress with co-workers to avoid embarrassing or insulting any member of the audience.
- **Keep puppet stories short and to the point.** Complex stories often fail to communicate intended message.
- **Combine puppets and tape recordings.** By playing a recording in conjunction with a puppet show, many interesting effects can be added. Musical backgrounds or sound effects can accompany the show: a speech by a well-known personage can be recorded and acted out later; or, an entire script involving several different voices can be recorded and later played back while the puppeteer manipulates the characters.
- **Involve the audience in spontaneous performances.** Have the puppets ask questions and develop a discussion between the puppets and members of the audience. In Bolivia, extension workers found it effective to have a puppet strike up a conversation with a leading farmer in the audience and ask him questions about good farming practices. Other farmers learned by listening to the exchange. Such conversations should not be worked out in detail in advance, and the puppeteer must be alert to fruitful areas of conversation as the show progresses.



- **Practice puppet movements.** Puppets can be a very versatile medium. With a little practice on the part of the puppeteer, the puppets can be made to appear to be talking, walking, or even playing the piano. A few minutes spent rehearsing movements in front of a mirror adds realism to a performance.

Suggested Applications

To promote discussion about village problems and to suggest solutions to those problems.

To dramatize the importance of eating balanced meals, eating fish and other protein-rich foods, of using the right kind of seed, etc. Using contrasting characters, "Mr. Strong and Mr. Weak" or "Mr. Good Farmer and Mr. Bad Farmer," is an effective way to communicate such information.

To explain in a dramatic form the functions of a health center or a cooperative marketing organization.

To provide practice for children by having them act out simple plays.

Evaluation Questions

Was the show carefully planned and scripted so that the message was readily understood?

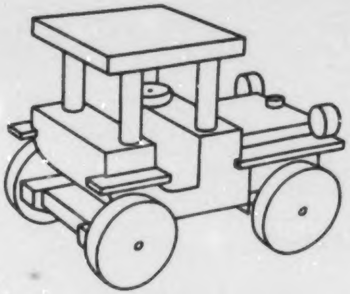
Did the puppets attract and hold the attention of the audience? If not, perhaps a different medium should have been used.

Were the individual puppet characters readily identified visually as well as by the sounds of their voices?

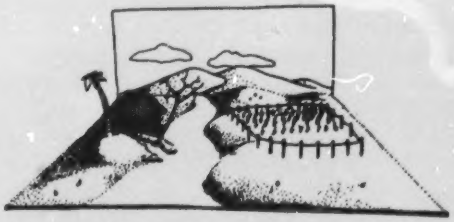
Was the puppet play appropriate to the level of the audience? Did the puppet play help to meet objectives?

Models

Models, as used in this manual, are defined as representations of real objects. They can shrink or enlarge an object, or represent it in its true size. For example, the earth can be shrunk to the size of a basketball, or a mosquito can be enlarged to the size of a sea gull. A model of a six-month-old baby might be its real size. Some models have removable parts—the human body, for example. Models are particularly useful in teaching because they can provide tactile experiences, and those with removable parts provide manipulative experiences as well.



Many simple models can be made by teachers and extension workers. They can be constructed from wood, metal, paper, cardboard, paper maché, clay, plaster of Paris, and many other materials. Terrain models showing crop distribution, flood control systems or contour plowing always draw crowds at an agricultural show. Suggestions for making terrain models are given in Appendix 4.

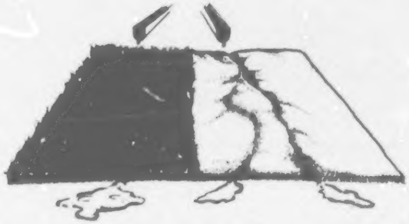


When making and using models keep the following ideas in mind:

- **Models must be factually correct.** It may be practical to make an exact replica of an object. Avoid models that give false impressions.
- **The audience must be able to understand the scale of a model.** A child looking at a model of a mosquito should not think that mosquitoes grow as large as birds.
- **Construction should be sturdy and simple.** This will facilitate handling and storage.
- **Store carefully.** Store in cardboard boxes or plastic bags in a clean, dry place.
- **Involve the audience.** Model making can be fun for nearly everyone. One secondary art teacher had her children make models of foods. These were displayed in food groups on classroom display boards. The best models were used at the local health clinic in a nutrition display.

Suggested Applications

To demonstrate soil conservation as shown in the illustration. Thick, grassy sod is placed on the left; bare soil on the right. A light stream of water trickles down across each plot. This soon erodes the soil, but leaves the grass unscathed. On a larger scale, two model farms could be set up, one showing good water control processes; the other, poor processes.



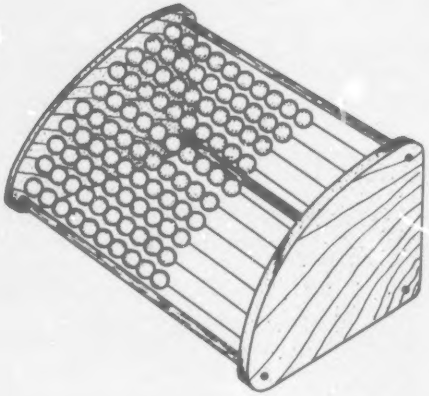
To show construction techniques, models can be made of chicken houses, fence or latrines.

To make working models of machines ranging from a simple pulley to a complex automobile differential, an Erector or Meccano set can be used.

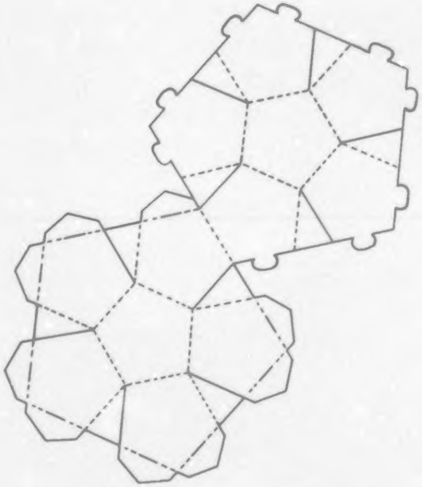
To teach basic science or mathematics principles, many different kinds of models can be used such as:

Wire and paper maché spheres can be used to make a model solar system. Watch the scale used to avoid false impressions.

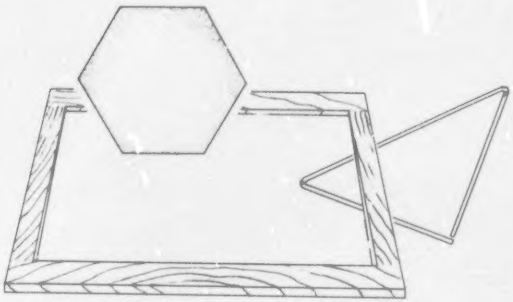
An abacus made from wire and pieces of wood or bottle caps with holes drilled in them.



Polyhedrons made of heavy paper or card.



Models of triangles, squares, hexagons, etc. These can easily be made of sticks, heavy wire, cardboard or other materials.



A skeleton of string and bamboo can be made by children. Be sure the child is aware of the differences between his model and the real thing.

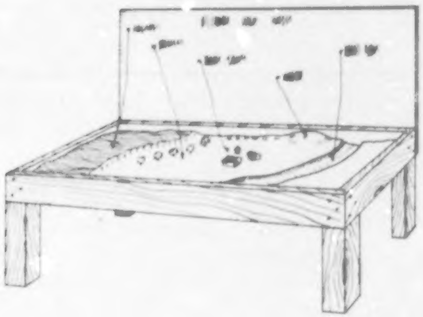
Clocks can be made of cardboard or thin plywood.

Using salvaged electrical parts, a variety of circuits can be set up on plywood bases to demonstrate electrical principles.

To teach the social studies:

Globes can be made by children from a calabash or other round gourds. Oceans, land masses, major rivers, and other features can be painted on the gourd to create a fine substitute for a commercial globe. More important, the child learns about geographical features on the earth in the process of making the globe.

Children can make a model of their own village in a sandbox. Houses can be made of heavy paper, and bits of plants and twigs can add realism. Similarly models can be made of other kinds of buildings—Eskimo igloos, Indian teepees, stilt houses. Also, a model of their village can be constructed in a sheltered area of the compound. It can be a learning experience for the entire school and a rewarding activity for the class constructing it.



Evaluation Questions

Was a model needed or could the real thing have been used?

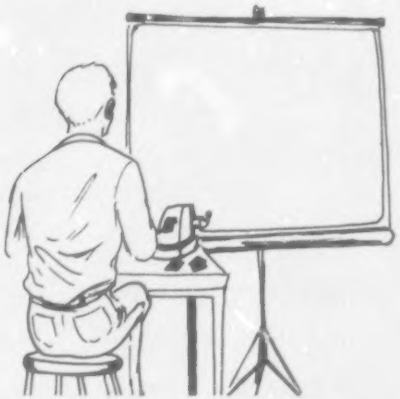
Was making the model worth the time and expense?

Could a simpler visual material such as a chart or a photograph have communicated as well?

Did the model create any wrong impressions as to size or scale?

Could the audience see important details?

PROJECTED MATERIALS



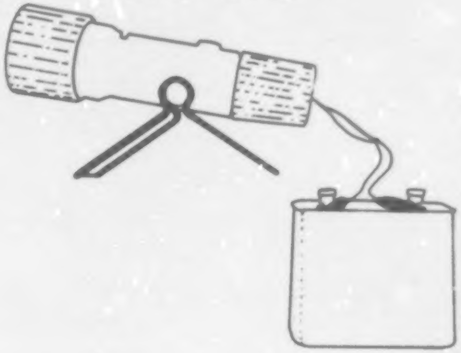
Because a bright light stands out in darkened surroundings, projected materials often capture the exclusive attention of an audience. Therefore, they generally have great appeal. Because of their appeal, properly produced materials may promote acceptance of new ideas or practices that are presented by slides, filmstrips and motion pictures, or by projecting photographs or drawings with opaque or overhead projectors.

When using projected materials, avoid those in which the pacing is too rapid and those with complex production techniques (cutaway drawings, slow motion, fades and dissolves, flashbacks, etc.). A simple, straightforward presentation, culturally appropriate, can compel attention, and can present a process or describe a situation in ways that will be easily understood. The best way to secure materials appropriate for an intended audience is to make them, even though electric power, cameras and projection equipment, and some production skills will be needed.

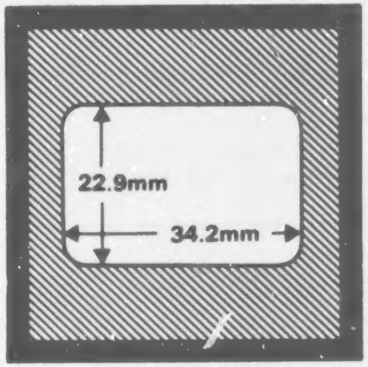
There are advantages and disadvantages to using several varieties of projected materials, and some general considerations of projection applicable to projected materials should serve as guidelines for selecting the medium.

Slides

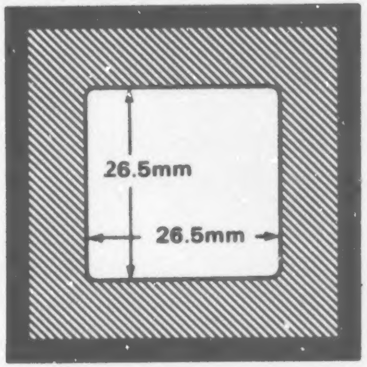
A single slide or carefully planned slide sequence, accompanied by narration, can be one of the most useful projected materials. When using slides in a village or school where electrical power is not available, projectors can be obtained that operate on a variety of voltages. Some are designed to be used with automobile batteries or small generators coupled to a bicycle. Several flashlight-type projectors have been developed that project a reasonably bright image about 3 x 4 feet in size. It is possible to construct a slide projector from wood or sheet metal and a few optical and electrical parts. Plans for two such projectors are included in Appendix 5.



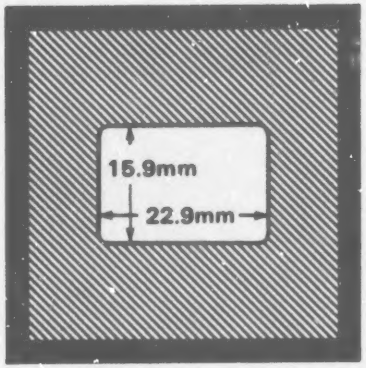
Before making slides, check the kind of slide projector available. Slides come in a variety of sizes ranging from approximately ¾" x 1" to 3¼" x 4". The most common slide is called the 2 by 2. This refers to the slide mount and actually includes a number of different image sizes. The four most common are shown below.



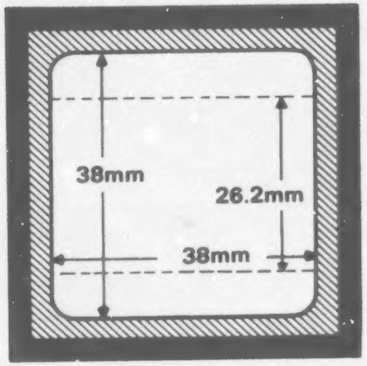
135 – 35mm



126



135 – Half Frame



127 – Super-Slide (38 x 38mm)
828 – (26.2 x 38mm)

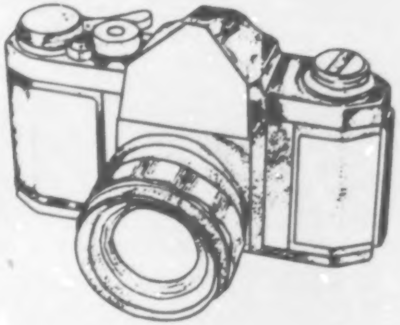
Handmade Slides

There are many occasions when a title slide or a slide with a simple illustration or perhaps a few words is needed. There are several ways that such slides can be made with materials that are readily available in most places.

- Scratch the image with an awl or needle on a piece of black and white film that has been exposed and developed. The unexposed ends of color film can be used in a similar manner.
- Use fine point, felt-point pens on clear photographic film, acetate, or plastic sheeting. The ink in some pens works well; others tend to run. Check what is available locally and make a few tests to see what combination of ink and base works best. India ink and most colored inks will run on clear acetate; however, art stores usually sell treated acetate that will accept ink.
- Ink or colored pencils can be used on acetate that has a frosted or matte surface. A transparency made on matte acetate should be sprayed with clear plastic or dipped in lacquer to increase its brightness when projected.
- If a thermal or heat copier is available, it can be used to make high quality slides. Thermal copiers are available at some Peace Corps offices and some schools in larger cities. Thermal copying is described in detail in the next section under duplication.

One of the advantages of using handmade slides is that they are not restricted to standard film sizes. Slides can be made the size of super slides or any other shape and size that will fit in a 2 by 2 mount. Handmade slides are ideal for use with larger projectors such as a 3¼ by 4 lantern slide projector. Slide mounts can be purchased or made from thin cardboard.

Photographic Slides

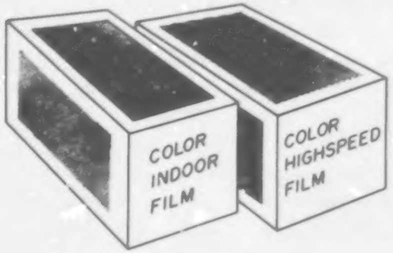


Many inexpensive cameras are available which will make good quality color slides for teaching purposes. When planning such slides, consider the following:

- **Choose a camera and accessories that will meet your needs.** A camera in the $30 to $50 range can be used for most outdoor photography including distances as close as two or three feet and indoors with flash. Closeup attachments are available for copying. Generally speaking, single-lens reflex cameras are best for copying and for closeup photography. They can be focused as close as 12 to 14 inches, and the viewfinder shows almost exactly what will be in the final picture. Single-lens reflex cameras generally cost $150 or more, but are well worth the money if extensive closeup photography is planned, and if you are willing to take the time needed to learn to operate the camera properly. Before buying any camera, consult a qualified dealer for information about the kind of equipment to meet the need.

- **Learn to use the camera properly.** The starting point is to study the instruction book. There are several good booklets on slide making available from the Eastman Kodak Company. Study them carefully to improve pictures.

- **Choose the right film.** A wide variety of color films are available. Some are designed for indoor use, some for outdoors, and some for poor lighting conditions or "high speed" photography.



Choice of film depends on the job to be done, availability, and personal preference. Technical facilities and expertise are needed to process color film, so the selection of a color film should also be based on the availability of good, reliable commercial processing within the country or on a reliable mailing service. If unsure about film selection, start with a medium speed outdoor color film that will serve most needs. Such films are designed for use in daylight, but can be used indoors with blue flashbulbs.

- **Strive for good technical quality.** Focus carefully, avoid obstructing the lens with a finger or part of the camera case, hold the camera steady, and expose correctly. Many new cameras set exposure automatically. If adjustments must be made manually, following the guide on the film instruction sheet will insure consistently well-exposed pictures. Remember that a very light scene, such as a white house surrounded by sand or a light-skinned person dressed in light-colored clothing, will require less exposure than an average subject. Conversely, a dark subject such as a dark-skinned person against a background of foliage will require more exposure than an average subject.

Take pictures of a variety of subjects under different lighting conditions. Keep a record of exposures and carefully observe the results to provide a good guide to future picture exposure problems.

- **Compose the picture carefully.** More important than technical quality is how the subject is treated. First, decide what the subject will be doing. A farmer can be digging, planting, fertilizing, wiping his brow, or just standing posing. Keep the pictures active; the posed picture does little to convey the idea of a farmer's work. Second, keep it simple. Many otherwise good pictures are spoiled by poles or trees growing out of people's heads or persons or buildings in the background. Extraneous details that detract from the message should be eliminated. If the background is irrelevant, move in and shoot a closeup. When shooting flash pictures indoors, it is particularly important to watch for distracting reflections from shiny background objects. Unless slides are to be viewed by visually sophisticated audiences, shoot from a familiar angle. High or low viewpoints and odd angles are not always understood by the viewer.

Suggested Applications

To make a permanent visual comparison of a fertilization demonstration plot.

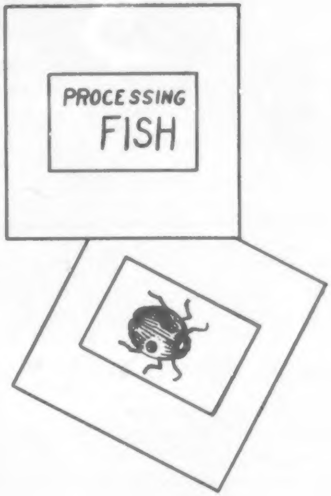
To teach a step-by-step process such as repairing a hole in a road, planting a garden, or processing fish.

To supplement a commercial filmstrip with locally made pictures.

To record the activities at an agriculture or health show as a guide for planning later shows.

To document bulletin boards or other displays as a guide for putting up similar displays at a later date.

To tell a story relating to nutrition, the values of using quality seed, cleanliness, etc. Handmade slides with simple characters scratched or drawn on acetate can be very effective. Flannel board presentations photographed in a step-by-step sequence are also good for this same purpose.



To record school or village activities as a guide for your successors.

To record geological features in the surrounding countryside as a local supplement to a textbook.

To tell the story of a farm or industry that will be visited on a field trip. Such slides can be used before a trip to orient the audience or later as part of a discussion of what was seen.

To motivate the audience by showing other villagers actively engaged in similar projects.

Evaluation Questions

Were the slides carefully planned?
Could they have been organized in a more effective way?

Did distracting elements get in the way of the message?

Could the audience understand each photograph or drawing?

Were the objectives met? Could members of the audience actually perform the steps of repairing a hole in the road? Could they state the steps necessary to plant a garden?

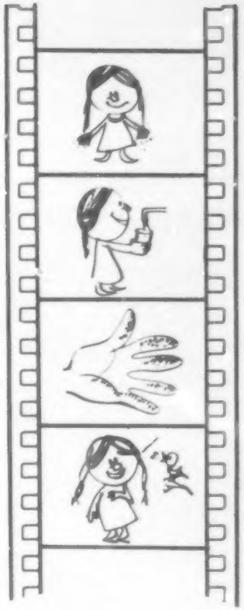
Could they repeat the key points in a nutrition story?

Filmstrips

A filmstrip is a series of pictures on one continuous piece of film. Although filmstrips lose the flexibility of slide sets (which can easily be rearranged for different purposes), they do have some real advantages. Filmstrips can be carefully sequenced and the sequence will remain unchanged no matter who uses the strip. Once a filmstrip has been threaded properly, all the frames will appear in proper position. Filmstrips are compact, and one small can will hold the equivalent of several dozen slides. The cans are convenient for storage and mailing. Filmstrips on nearly every subject are available from commercial suppliers; and, in many countries, are available through central agencies such as the ministries of agriculture, education or health.

Most commercial filmstrips are made with a single-frame camera. However, double-frame filmstrips can be made by using a double-frame camera. The diagrams show examples of both kinds. Which is used depends on the kind of camera and projection equipment available.

single frame filmstrip

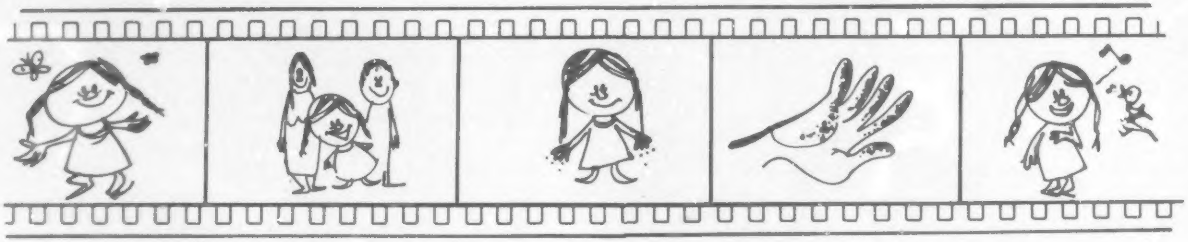


To make filmstrips, keep the following ideas in mind:

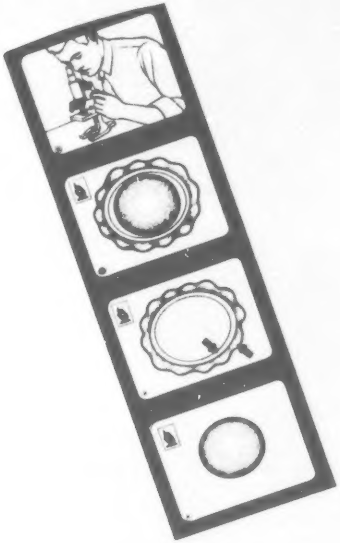
- **Plan carefully.** The individual frames cannot easily be rearranged after shooting, so plan the sequence of pictures carefully and then follow the plan exactly. Following the steps of preparing a content outline, a treatment, and storyboard-script, as illustrated in Appendix 1, can help assure a well-organized final product.
- **Consider a variety of production techniques.** A filmstrip can be made by shooting a series of live action scenes or by shooting a series of still photographs, but there are many other alternatives. A puppet presentation or the steps of a flannel board presentation can be photographed. Titles can be interspersed by taking pictures of titles written on a chalkboard or cutout letters on a flannel board or other suitable background. Handmade filmstrips can be made by using one of the processes listed under slidemaking. Try making a series of India ink or soft pencil drawings on a sheet of paper and then copying them with a thermal copier. Several strips of five or six pictures can be included, and these can then be cut up and taped together to make one continuous strip. This method presents a bit of a projection problem as there are no perforations to guide the film, but such a strip can be pulled through by hand.

Most of the use and evaluation suggestions that apply to slides are also applicable to filmstrips; however, one particular use of filmstrips deserves emphasis.

double frame filmstrip



Filmstrips covering basic processes can be carefully planned and produced so they will be appropriate to large segments of the population. With printed guides about using them, these filmstrips can be distributed to teachers, health workers or extension agents. Such materials can increase the effectiveness of their communication. If recording facilities are available, a filmstrip can be accompanied by a tape narration. A particularly good example is a series of filmstrips on basic life processes, planned by Dr. Gerald Winfield of the U.S.A.I.D. Information about this series is available from the Norwood Studio, 5104 Frolich Lane, Tuxedo, Maryland 20781. Below is a sample of a few frames from one of these strips.



Motion Pictures

There is little doubt that motion pictures can be extremely effective for teaching in schools or rural villages in developing nations. Motion pictures share one primary attribute of still projection—they compel attention in almost any circumstance.

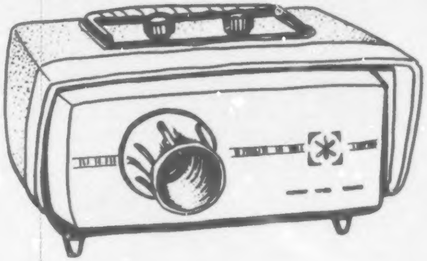
However, motion picture projectors are expensive to purchase and generally are not readily available. Even if projectors are available, a more critical disadvantage is that films relevant to the problems of a village or a class in the typical schools of developing nations are scarce. Some films would be applicable in formal education classes such as science, geography or mathematics, but these are difficult to obtain and are beyond the budgets of most schools.

If a motion picture projector is available, films can often be obtained from agencies of the United States and other nations as well as ministries of agriculture, education, health and information. These will usually be 16mm films.

In recent years there has been increased use of 8mm films. A new format called "super 8" has come onto the market and is being widely used for short, single concept films, film loops, and regular educational films. The super 8 format has resulted in new equipment such as lightweight projectors that thread automatically and self-contained cartridge projectors that combine projector and screen in a unit 9½ inches long, 5½ inches wide, and 7 inches deep. Some projectors will accommodate either regular or super 8 films.

Eight millimeter films have several important advantages for those who want to use films to communicate, but cannot afford 16mm equipment or films.

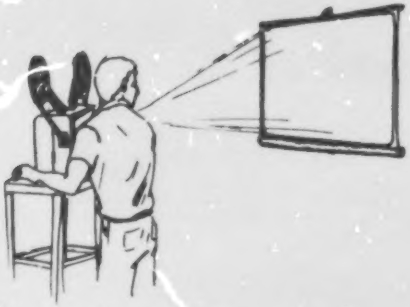
1. Short, 8mm silent cartridge films are relatively inexpensive (average cost about $10), or they can be made by one who is willing to devote some time to learning the fundamentals of planning film sequences and operating a camera.
2. Cartridge films can be used with a minimum of instruction and supervision.
3. Equipment is lightweight and easily transported.



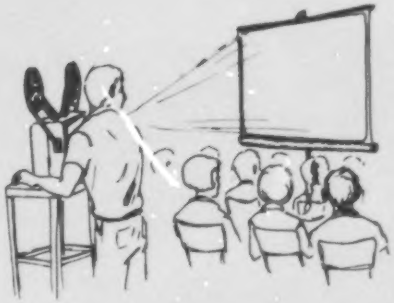
For anyone interested in making films, several publications explain the fundamentals of planning a film story. Camera operation is also discussed in a number of publications; but, in general, the instruction booklet that comes with a camera is adequate for a start toward making good films.

Keep these ideas in mind when choosing and using films.

- **Consider the audience when choosing a film.** The audience must be able to identify people and scenes, so avoid films that use odd angles and fast pacing. The presentation should be simple and straightforward.
- **Preview the film in advance.** Viewing a film before showing it to an audience is helpful in introducing it and even in deciding what parts to show. If only parts of the film are applicable, they can be carefully marked during preview by inserting a piece of paper in the reel at the points where the film is to be started and stopped.



- **Introduce the film.** Before a showing, tell the viewers what the film is about and what they should look for.
- **Use proper projection practices.** Instruction sheets that come with the equipment and instructions printed on the case or the projector itself usually provide all necessary information. Always set up in advance to be certain that the equipment is working adequately. Keep a spare projection bulb and a spare exciter lamp on hand and know how to change them.



- **Discuss the film.** Discussion, after a film showing, may be the most important part of the presentation. Ask questions about pertinent parts of the film. Encourage questions from the audience. This provides an opportunity to point up misconceptions or things that were missed.
- **Re-show all or part of the film.** Re-showing provides the audience an opportunity to grasp more fully the concepts presented and to pick up important details that may have been missed.
- **Combine the film showing with other media.** Bulletin boards, posters or wall newspapers can be used to announce film showings. A chalkboard, flannelboard or flip chart can be used to list important points when introducing a film or when reviewing it after a showing. Mimeographed handouts can be distributed to the audience as a ready reference to key elements in a film.

Suggested Applications

To attract and focus the attention of a large group on a major campaign or project.

To show the step-by-step progress of a major project such as a road building, irrigation or water supply project.

To document a local event.

To show processes where movement is of particular importance such as the processes of meiosis or mitosis or the operation of a machine.

To demonstrate a process to a large group.

To entertain an audience. Entertainment films are popular all over the world and attract large crowds of people. Such films can be followed by a slide show, a short talk or some other presentation relating to a problem in the areas of agriculture, health, family planning and so on.

Evaluation Questions

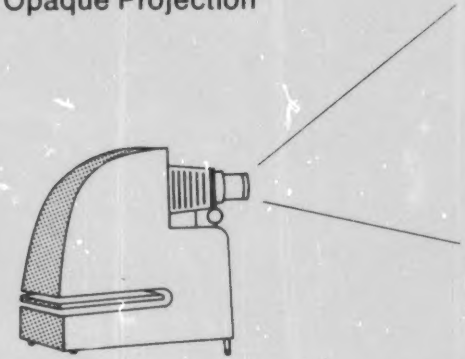
Was the film content and style of presentation suitable for the audience?

Could the same ideas have been presented with equal effect by using a simpler and less expensive medium?

Was the projection adequate or were there distracting elements such as unnecessary delays?

Would additional discussion before or after the film have helped the audience understand the ideas being presented?

Opaque Projection

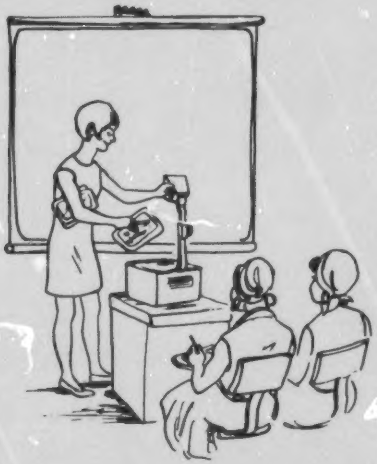


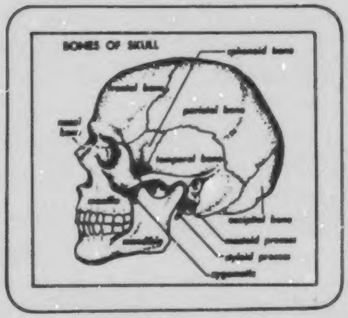
Opaque projectors are available for projecting materials such as maps, photographs, book pages, student papers, or even three-dimensional objects. This is often quicker, more convenient, and safer than handing the materials around the room. Most opaque projectors are large and cumbersome; however, some small projectors are available that are useful for projecting small pictures from a book or magazine onto a piece of paper or cardboard so that it can be traced to make an illustration for a poster chart or flannel board. Opaque projectors require a dark room because they have a low light output compared with projectors which show transparencies.

Overhead Projection

Overhead projectors are used to project large transparencies as well as some opaque and translucent materials. With an overhead projector, the image is projected on the screen behind the teacher. The large transparency size coupled with an efficient illumination and lens system provides a large, bright image on the screen that does not necessitate darkening the room. Some teachers have built their own overhead projectors, but this requires optical and electrical parts and considerable skill. See Appendix 5 for suggestions on making an overhead projector.

A wide variety of materials can be used on an overhead projector in addition to hand-made or commercially prepared transparencies. Partially transparent objects, such as a plastic ruler or protractor, project very well and can be used for demonstrations on measuring. Strips of cardboard or thin wood can be fastened together with paper fasteners to make movable joints for demonstrating geometric figures. Gears or other moving parts can be placed on the stage of the projector and moved by hand as their interrelationships are discussed.





There are several techniques for making overhead transparencies including photography, transferring an illustration from a magazine by the lifting process, diazo and thermal processes, and various hand-drawn techniques. Hand-drawn transparencies are the most useful when resources are limited. They can be made on cellophane, clear acetate, or old photographic film that has been cleared in a strong chlorine household bleach. Used film may sound like a scarce item. Old X-ray films are often available from hospitals, and they are ideal. Some translucent materials such as thin tracing paper or matte acetate can be used. Matte acetate looks something like very thin tracing paper and is available in most art supply stores. Lettering or drawing can be done with waxed pencils, India ink, colored drawing inks, and some felt-point pens. See what is available locally and make some tests to find what will work. Transparencies on matte acetate can be made more transparent by spraying with clear plastic spray.

When making and using overhead materials consider these factors:

- **Keep it simple.** Use one basic idea in each transparency and avoid unnecessary visual elements.
- **Use legible lettering.** Combine a simple style with careful spacing and be sure the letter size on the transparency is no less than ¼" high.
- **Use imaginative design.** This can help attract and hold attention and increase understanding. Overlays can be used over a basic transparency to highlight or point out specific elements.
- **Use good projection techniques.** Line up the projector and focus in advance. Face the audience and stand to one side of the projector so an arm or shoulder does not block part of the projected image.

Overhead transparencies can be used to help teach a variety of concepts in many subject areas. Evaluation of effectiveness should be based on their contribution to meeting the instructional objectives.

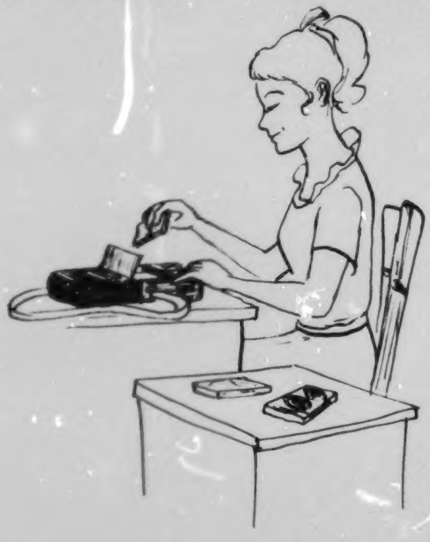
Projection Techniques

There are many factors that can affect the quality of projected images. Three of these are particularly important: the kind of screen; the placement of the audience in relation to the screen; and the size of the image and its brightness in relation to the surroundings. In many situations there is little control over these factors; however, an understanding of them contributes to more effective production and use of instructional materials.

- **Screens.** Several kinds of commercial screens are available, but for most purposes a piece of white vinyl plastic will provide an adequate screen at a much lower cost. A white vinyl window shade is ideal as it can easily be rolled up for carrying and storage. Satisfactory screens can also be made by painting a piece of hardboard or plywood with flat white paint or by stretching a white sheet on a wall or between two poles.
- **Audience placement.** The audience will be able to see better if they are not at an extreme angle to the screen. Before a show, look at the projected image from a variety of positions to determine where the audience should sit.
- **Image size and brightness.** Keep the image size large enough so that it can be seen by all members of the audience. Image brightness can be improved by projecting in a relatively dark place. In a school situation, close the window shutters or put a drape over the window. Any lightweight cloth, reasonably opaque, will work well. If covering the window creates a ventilation problem, place the drapes a few inches from the wall so they cover the window and an area around it, but still allow air to circulate. Place the screen in a spot where a minimum of light from sources other than the projector will reach its surface. Remember that the kind of materials projected affects image brightness. Color pictures or black and white pictures with fine detail require high screen brightness. If simple materials, such as line drawings, words or graphs are used, lower screen brightness will be satisfactory.

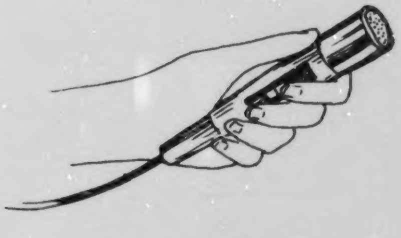
RECORDING

Tape recordings can range from simple conversations to complex presentations that combine narration, music and indigenous sound with the signals necessary to operate a slide or film projector in complete synchronization. Tape recordings are inexpensive, durable, easy to transport or mail; and the tapes can be erased and used over and over again. Recorders are available in a variety of types, sizes and prices. Until recently, most recorders used ¼-inch tape on a reel, but recorders that use ⅛-inch tape in cassettes are becoming increasingly popular. Reel-to-reel recorders are advantageous when high quality is needed or when a considerable amount of editing is required. Cassette recorders are particularly useful when portability and ease of operation are important. Both types are available for operation on batteries or external

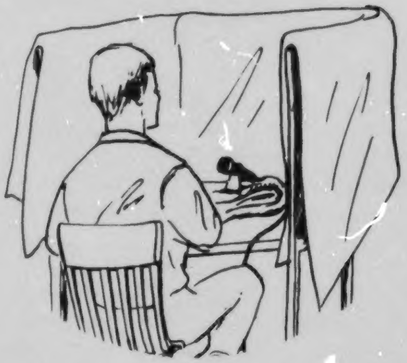


power sources. Choice should be based primarily on the intended use. The instruction booklets that come with each machine provide step-by-step details of operation. No matter what recorder is being used, there are several items that should be considered when making recordings.

- **Microphone choice and use.** Tape recorders come with a microphone that is electronically matched to the particular type of recorder. If the microphone must be replaced, it is important that the new one also matches in electronic characteristics. In general, when recording one person, place the microphone 9 to 18 inches from the person at about the level of his or her mouth. When recording the voices of several persons, try to place the microphone, face up, near the center of the group in the middle of a table. When a microphone is set on a table, put a folded cloth under it to avoid vibrations. Do not run a microphone cord parallel to an A.C. power cord. Cross the cords at right angles to avoid hum. Avoid handling the microphone during a recording to reduce noise. Microphones are easily damaged; treat them gently.

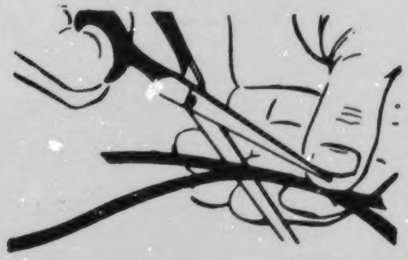


- **Acoustic treatment.** Recording quality can be improved by making a temporary blanket booth or by placing the microphone in a corner with a blanket or other soft material behind it. This reduces reverberations and helps cut down background noises. Outdoor recordings can often be improved by blocking off extraneous noises with a blanket or mat.

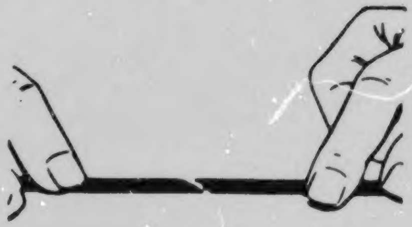


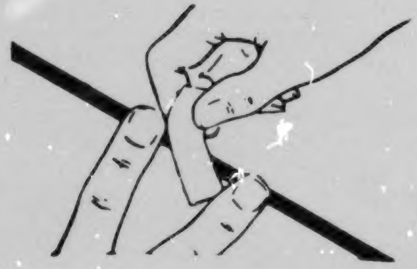
- **Recording level.** Setting the recording level too high will result in distorted sound. Setting it too low will emphasize background noise. Follow the instructions that come with the recorder to determine the proper settings.
- **Tape splicing.** Sooner or later a tape breaks, but it can easily be spliced together. Use tape-splicing tape, not ordinary cellophane tape, and follow these three steps:

1. Hold the ends of the tape together with a slight overlap and cut both pieces at the same time at an angle of about 60 degrees.

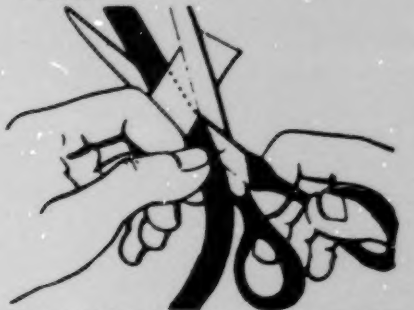


2. Butt the cut ends together, uncoated side up (shiny side), and cover the joint with a piece of splicing tape.





3. Trim off the excess tape, cutting slightly into the edges of the recording tape to prevent binding of the splice as it passes through the recorder.



Inexpensive splicing machines that produce diagonal splices semi-automatically are available. Tape in cassettes can also be spliced but because of the narrow width, splicing must be very carefully done.

- **Tape editing.** This is a selective cutting and splicing operation used to remove unwanted portions or to rearrange parts of a recording. The exact point for editing can be located by moving the tape back and forth by hand across the recording head and marking the point with a waxed pencil. Remember that one track from a multi-track recording cannot be edited without cutting into the other track or tracks.
- **Recording from record players or radios.** To record from record players or radios, place the microphone in front of the speaker. Better quality recordings can be obtained, however, by connecting the recorder directly to the speaker terminals. Some record players have output jacks that can be connected to the microphone input. See the instruction booklet that comes with the recorder for the proper method of making such connections.

Suggested Applications

To record interviews for later playback over a local radio station. For example, a recording of two farmers discussing the success of a new variety of seed or the increased yield that resulted from using fertilizer can be of great interest to other farmers.

To record the voices of several different persons to accompany a puppet show.

To record responses to an evaluation questionnaire. Responses can be studied in detail later and can be saved to help succeeding volunteers get to know the people in the area.

To record comments of local persons to accompany a slide show, silent film, and flip chart. For example, recordings of comments made at a fertilizer demonstration site could be used with slides of the treated and untreated plots.

To record news or current event programs for later presentation to a class.

To record a teacher's presentation. Listening to her lectures occasionally can help a teacher to improve classroom presentations. Was the recording intelligible?

To record language lessons. The immediate feedback that results from recording a passage and then listening to the pronunciation can be very helpful in developing language skill.

To help in the diagnosis of speech problems.

To dictate spelling lessons.

To record songs, skits or dramatic presentations so that students can evaluate their own work.

To make tapes for exchange with schools in other places. Exchanges can be coordinated through World Tapes for Education, P.O. Box 15703, Dallas, Texas.

Evaluation Questions

Were different voices easily identified?

Would different microphone placement or acoustical treatment have improved the recording quality?

Would editing have helped to remove extraneous noise or unnecessary details?

Could editing have helped organize the content in a more logical manner?

Did the tape really help do a better job of communicating?

ILLUSTRATIONS

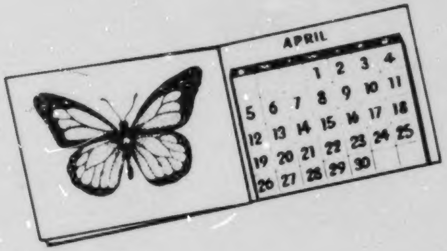
A single illustration, well conceived and well designed, can be an effective message conveyor. An illustration can bring meaning and enrichment to verbal information. To communicate effectively, an illustration must be:

Factually accurate.

Attractive to catch the attention of the audience.

Appropriate to the idea being expressed visually so that it does communicate the idea to the audience.

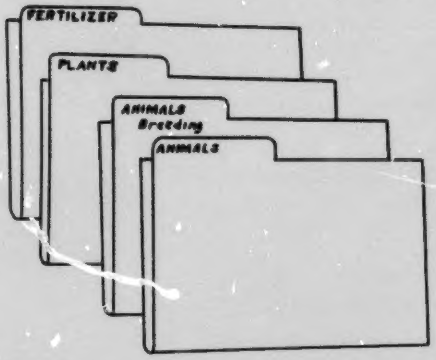
The basis for conceiving and designing good illustrations is a collection of visual materials. Newspapers and magazines are valuable sources. The embassies and consulates in most countries have literature attractively illustrated and representative of their country. The information services within a country usually have a variety of materials available upon request. Often, commercial stores or concerns have travel folders and other pictorial materials. Also, calendars and catalogs are good sources of illustrative materials.

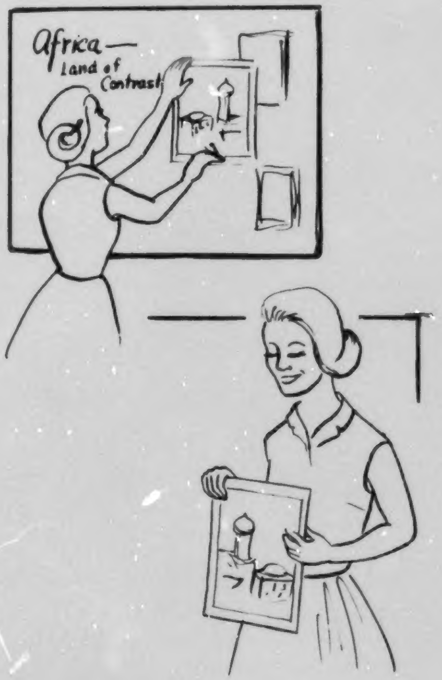


Each picture, considered a potentially useful one, should be clipped and filed. A pile of unsorted pictures will likely be useless. A picture file should be organized so that an illustration can be found when it is needed.

A cardboard box and some old file folders will do as a starter. Label each folder clearly with a title that designates the category of pictures to be filed in it. For agriculture, appropriate category titles might be **ANIMALS, PLANTS, FERTILIZERS.** For health, the titles might be **FOODS, DISEASES, HEALTH HABITS.**

Should the folder of pictures collected for any one category become too full, break major categories into sub-classifications: **ANIMALS, Diseases; ANIMALS, Breeding; FOODS, Proteins; FOODS, Carbohydrates;** etc. Select a category and sub-classification system appropriate to the need for illustrative materials. There is but one criterion for determining whether or not a filing system is good—in a minimum amount of time, the needed picture can be found.



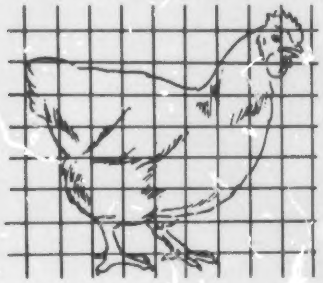


Pictures from a file can be used in many ways. They may be shown individually, placed on bulletin boards, or used in displays. They can be backed with coarse sandpaper for use on a flannel board. They may be used to make charts or posters. Additionally, the pictures in the file will serve as excellent sources of examples on newsprint for flip charts, and on paper to photograph for slides.

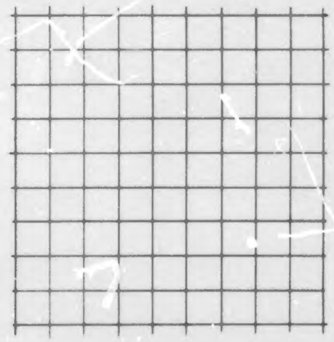
Squaring

There are several ways to copy or to transfer an illustration to a chalkboard or to a sheet of cardboard or paper. One way is the squaring method. This method requires no special skill or equipment to enlarge or reduce the size of any picture:

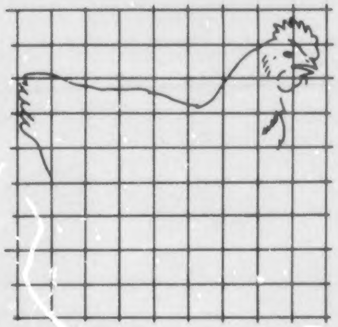
1. Lightly draw a series of squares on the picture to be copied or transferred.



2. Draw a series of squares on the copy paper, cardboard or chalkboard. These squares should be made proportionately larger or smaller depending on whether the final drawing is to be enlarged or reduced.



3. Draw the lines of the original picture, one square at a time, on the copy paper until the picture is completed. The lines making the squares on the copy paper should be erased after the drawing is completed



Detail in the original picture that is not appropriate to the idea being communicated can be eliminated. To save time, a grid can be made on tracing paper or acetate. This grid can be placed on top of the picture to be copied, thus eliminating Step 1.

Pantograph

The pantograph is a device that provides another useful way to transfer a drawing for a chart, poster or other visual.

Pantographs can be purchased or easily made. The pantograph shown in the illustration was made from four strips of wood about ¼" x ¾" x 16".

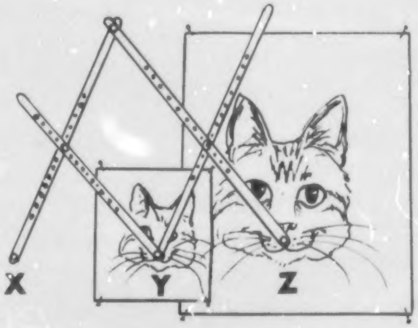
1. Holes were drilled at one-inch intervals.
2. Bolts were inserted in the holes to hold the strips together. The holes must be drilled large enough so that the joints will move easily, but without "play."

The position of the bolts determines the relative sizes of the copy.

To use a pantograph:

1. Fix the pantograph to a table or drawing board with a wood screw at point X.
2. Pass a pointed stick or pencil through both sticks at point Y, and a second pencil through the hole at point Z.
3. Fasten the picture to be copied under the pointed stick at point Y.
4. Fasten a larger piece of paper under the pencil at point Z.
5. Carefully move the pointed stick over the outline of the picture to be copied. The pencil at point Z will make a large copy of the picture or map.

Although using the pantograph takes practice, it is a convenient device for enlarging or reducing drawings, or reproducing a drawing in its original size.

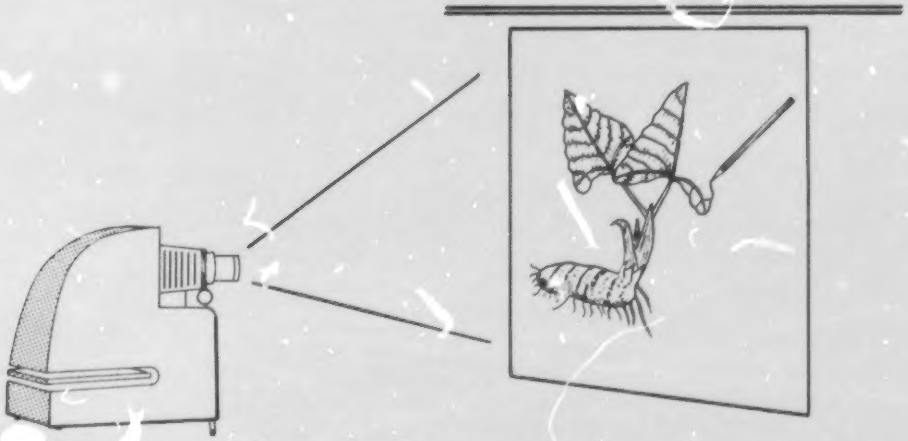


Projection Tracing

If a projector that will project opaque materials is available, it can be used to enlarge pictures from the file for a chart, a poster or a display, or onto a chalkboard.

Use the projector to cast an image onto the chalkboard or other surface. Trace the important elements of the picture carefully. Although the illustrations should be accurate in detail, only the essential lines need to be traced. Details not related to the teaching needs should be eliminated.

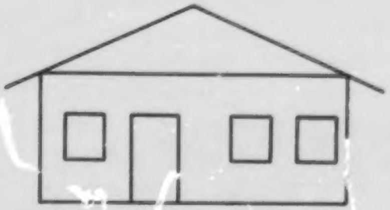
To enlarge a picture onto a piece of cardboard or heavy paper, trace the necessary lines with a soft pencil. Then go over them with ink, paint or a felt-point pen. When projecting a picture onto a blackboard, trace lightly in white chalk; then go over the lines with colored chalk where color is needed.



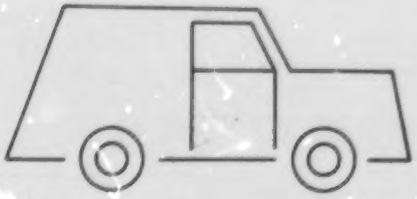
Simple Drawing

Drawing pictures that communicate effectively is not as difficult as many people seem to think. Some teachers have found that stick figures and simplified drawings communicate better than detailed drawings or photographs. The real problem in drawing is to visualize the subject in a simplified form. Nearly all objects can be viewed as geometric shapes or a combination of such shapes.

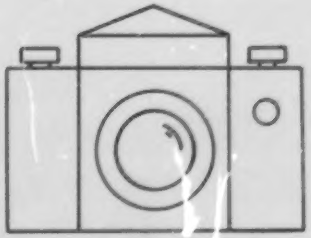
A building is composed of rectangles and triangles.

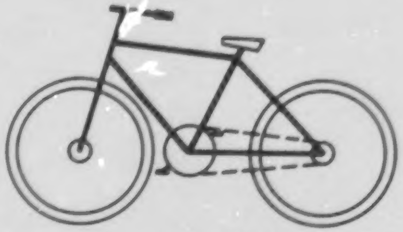


A vehicle is composed of rectangles, triangles and circles.

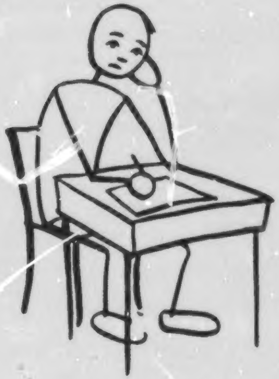


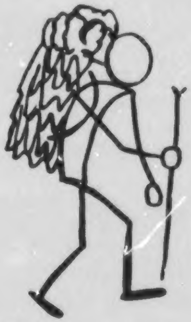
Similarly, a camera or a bicycle can be formed from combinations of basic geometric shapes.

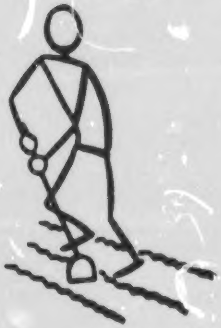


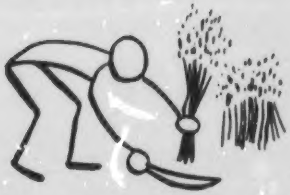


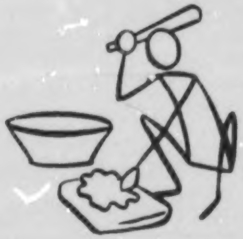
Drawing figures to represent people is a bit more complicated; however, they are still formed from basic shapes. There are three major factors to consider when making either stick figures or figures based on simple geometric shapes—proportions, distinguishing features such as faces or dress, and body movement.

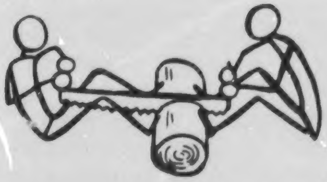


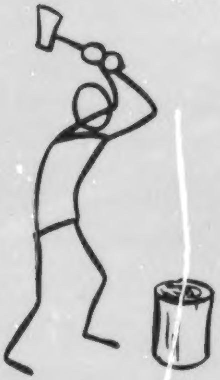


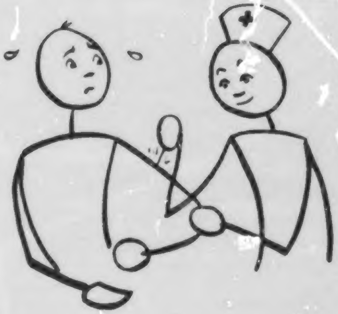


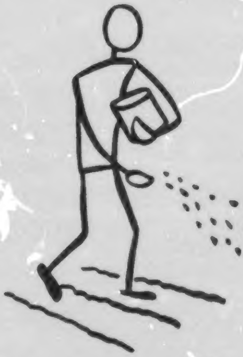


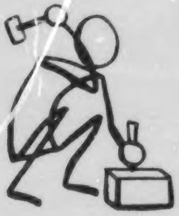


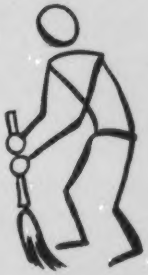


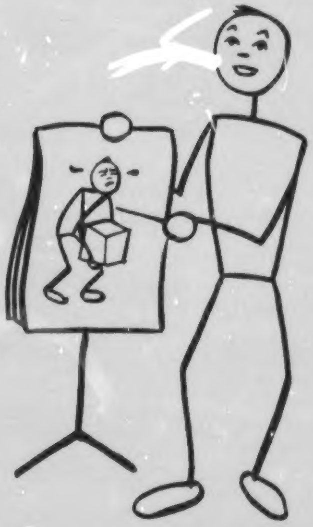




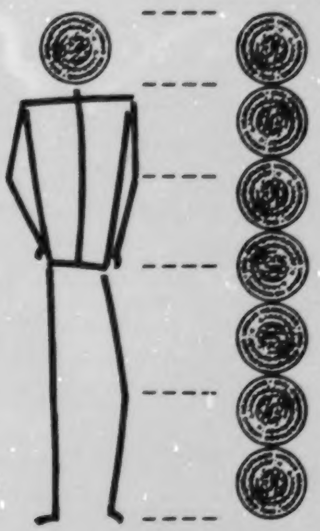






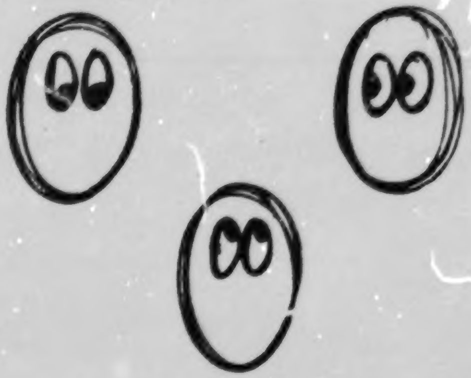


- **Proportions.** There are many guides for drawing a human body. One good guide is based on Tio Cabeza de Peso or Uncle Penny Head. This character is seven coins tall with proportions as shown in the illustration. The relative sizes of parts of the body would be different for children, with the body being proportionately shorter. As skill in drawing stick figures is developed, try drawing more shape to the figure. A variety of characters can be represented by a few simple combinations of rectangles and triangles. In general, the female figure is characterized by greater width at the hips, the male figure by greater width at the shoulders. Test the effectiveness of the drawings by showing them to a sample of the intended audience and by asking questions.

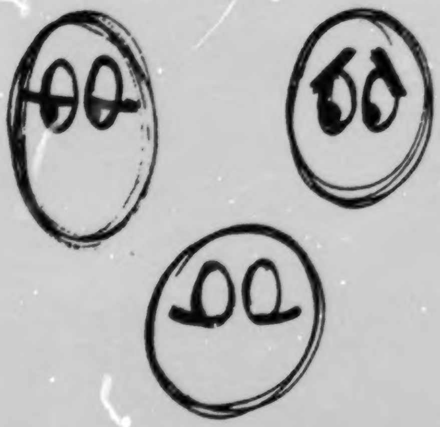


- **Distinguishing features.** To distinguish one figure from another, draw different facial features. A variety of facial expressions can be drawn by a few simple lines. Expressions vary with

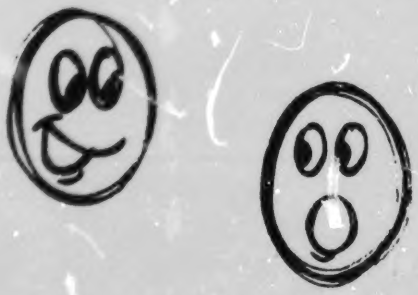
  the shape of the eyes and the position of the pupils;



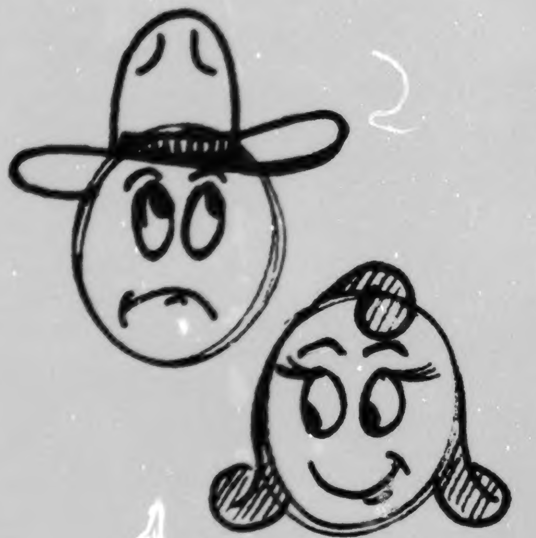
  the shape and position of the eyebrows;



  the shape and position of the mouth and other facial features.



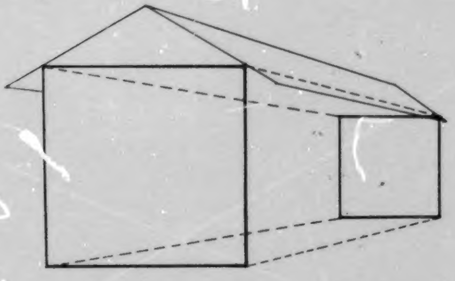
Try making some simplified faces. Vary the shape of the face, the expression, the hair, the kind of hat, etc.



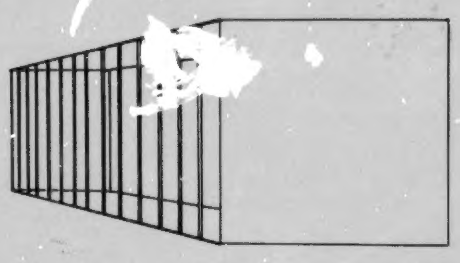
- **Body movements.** The human body moves continually. To show motion in drawings, consider where and how legs and arms bend. Consider balance. Follow this simple rule—the weight on the left of the backbone should balance the weight on the right. The illustrations shown will serve as examples that can be adapted.

As skill is developed in drawing, try making some drawings that show perspective. When making perspective drawings, a first consideration is the difference between reality of the object and the illusion that is being put down on paper. Following are some guides applicable to all perspective drawing.

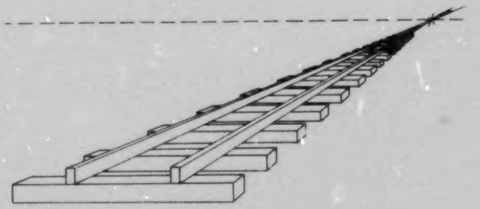
- When viewing an object such as a box or a building, horizontal lines appear to converge as the distance from the viewer's eye increases. Vertical lines appear shorter as distance increases. Consequently, in a perspective drawing, vertical lines forming the back of a building will be shorter than vertical lines forming the front of the building. This is the way one's eyes perceive the building even though, in reality, the height is the same at the front as at the back.



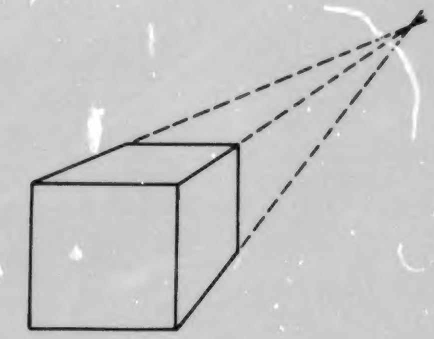
- As vertical lines decrease in length with distance, so do any spaces which occur between those lines. For example, the space between bars of a cage decrease as the distance from the viewer increases. Similarly, the cross ties on a railroad track or the heads of men standing in line seem to overlap in the distance.



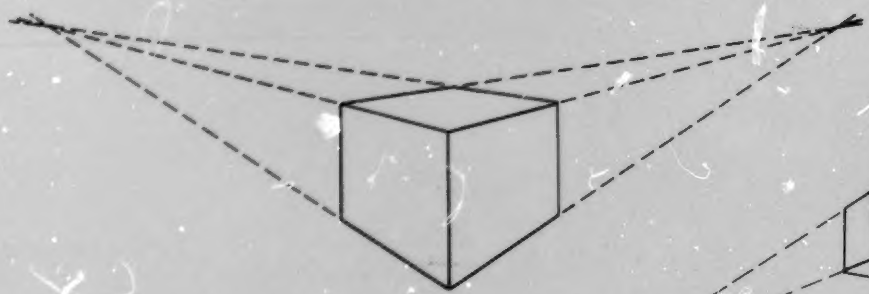
- When the length of an object is great enough or when any set of parallel lines is extended indefinitely, the lines appear to converge into a single point on the horizon. That point is called the vanishing point.



- One, two, or three vanishing points are possible in perspective drawings. One or two points are most commonly used.
- In one-point perspective drawings, the front view of the object is drawn with no distortion, and all lines of the object that indicate depth run from the front view to the vanishing point on the horizon or eye line.

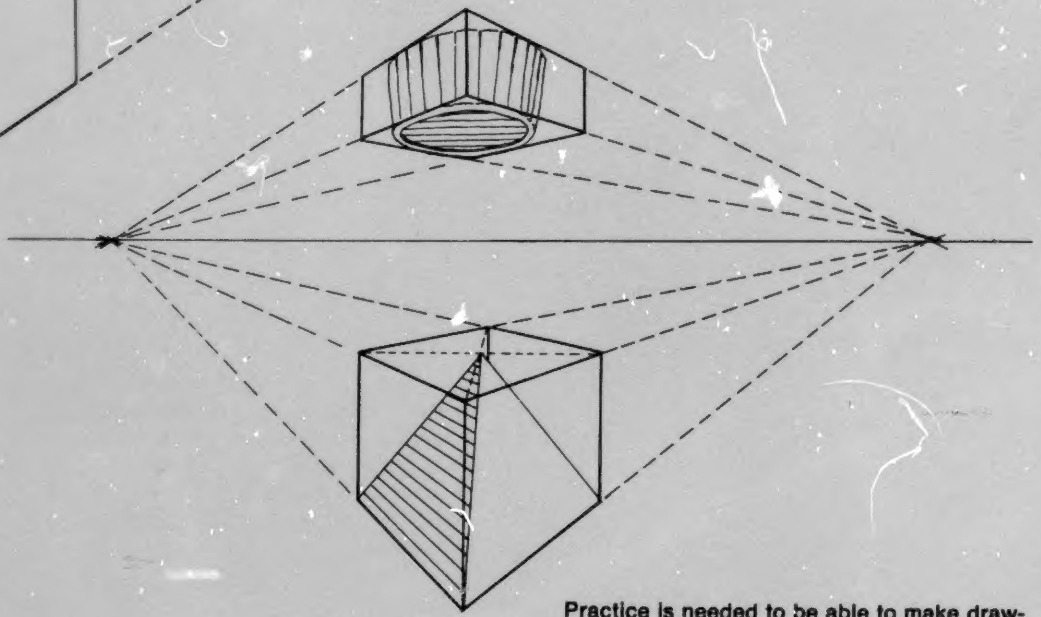


- In two-point perspective drawings, there are two vanishing points, one on the right and one on the left of the object. The lines representing depth start from the vertical line representing the nearest corner of the object and converge at the vanishing points. Horizontal lines on the right of the object converge at the right vanishing point, and horizontal lines on the left of the object converge at the left vanishing point. In two-point perspective there is no head-on view of the object. There is a view of two sides, and the horizontal lines forming these sides converge at their respective vanishing points.



- The vanishing point will always rest on the horizon line as the eye perceives it. When looking down on an object, the object will be below the horizon line. Conversely, when looking up toward an object, the object will be above the horizon line. The viewpoint will determine whether the perspective view of the object being drawn will include the top of the object, the bottom, or just two sides. In an exact head-on view, only one side of an object would be seen, and, in effect, there would be no perspective.

- Just about anything that is drawn in perspective can be described initially within the framework of a rectangle. Therefore, when drawing the rectangle in perspective, use the lines of the rectangle to determine the perspective and the proportions for the object being drawn.



Practice is needed to be able to make drawings of a variety of objects, animals, and people suitable for illustrations in leaflets or pamphlets or on flip charts, posters or chalkboards. Appendix 6 contains a number of drawings that might be adapted for such uses.

LETTERING

The effectiveness of instructional materials can be enhanced by the lettering used for verbal information accompanying illustrations. The lettering must be easy to read. Four factors should be considered.

- **Size.** Experiments have shown that to be readable, letters should be at least a half-inch high when the viewer's distance is 10 feet. They should be proportionately larger as the viewer's distance increases.

  When giving presentations outdoors, groups are usually large and therefore viewing distance usually is much greater. Increase lettering size accordingly.

- **Style.** The style used also determines how easily the letters can be read. Letters in simple style are more easily read than those in a complex style. In long sentences or paragraphs, lower case letters combined with capitals are more legible than all capitals.

Difficult to read

Easy to read

- **Spacing.** Spacing refers to the amount of space left between the letters in a word, between the words themselves, and between lines. A neat lettering job can be ruined by improper spacing. There are two types of letter spacing, mechanical and optical.

In mechanical spacing the separate letters are treated as if they were in a box or rectangular block. The spacing is determined by the equalization of the distances between the blocks. This type of spacing, while relatively easy to do, is commonly used only by machine lettering, as exemplified by this printed page. With optical spacing, the space between the letters is equalized by considering the differences in the shapes of the various letters. The alphabet can be divided into three letter types.

The first category is the regular or rectangular letter such as E, H, I, M, N, and U. There is no problem in spacing between these letters.

E H N U

In the second category are the circular letters—B, C, D, G, O, Q, R, and S. They should be placed closer to their neighbors to equalize the white space or area between the letters.

C G O Q

The third category of letters are the irregular letters such as A, F, J, K, L, P, T, W, X, Y, and Z. These letters are more difficult to space. The basic consideration is the equalization of the area or white space between the letters themselves.

A J T Y

Most people have a tendency to leave insufficient space between letters which give them a squeezed appearance as shown in the example of the word, MINIMUM. Avoid crowding to improve legibility.

MINIMUM

MINIMUM

In addition to spacing carefully, avoid crowding between words and between lines. There are general rules for spacing lettering, but the best way to learn is through practice. Keep in mind that spacing is simply the arrangement of letters to form words so they can be read easily and look attractive to the eye.

- **Contrast.** The contrast between letters and their background is an important factor in readability. Light-colored letters should be used on a dark background or dark letters on a light-colored background. When using light-colored letters on a dark background, the lines should be slightly thicker than when using dark-colored letters on a light background.

Family
Planning

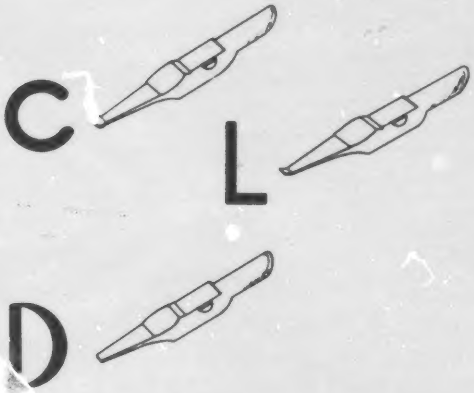
Family
Planning

Lettering may be the job of a highly skilled artist; however, anyone concerned with effective communication should be interested in the extent to which lettering transmits ideas more effectively. In addition to being neat and easily read, lettering should be easy to do. There are several lettering techniques.

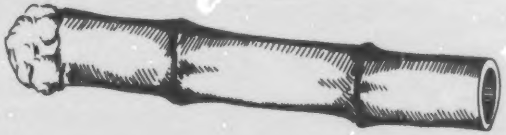
Hand Lettering

Legible hand lettering is really quite easy to do. Keep in mind the basic rules. Use a simple style, space carefully, contrast the letters with the background, and make the lettering large enough to be read easily by all viewers. Draw guidelines and lightly sketch in the letters to get the proper spacing.

Lettering pens in a variety of sizes and styles are available from most book or stationery stores. These can be used with India ink or with colored drawing inks. The illustration shows one legible, hand-lettered alphabet.

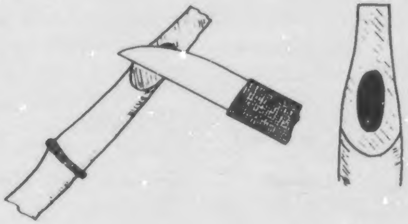


Felt-point markers are particularly useful. They come in a variety of styles and colors, and will write on paper, cardboard, and many other surfaces. When planning to do lettering on plastic, be sure the purchased markers can be used on a plastic surface.

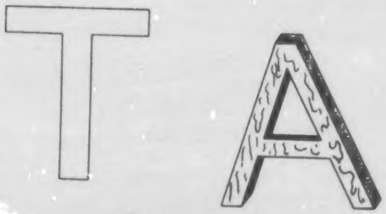


Markers can be made with a piece of bamboo and some absorbent cotton. Choose a piece of bamboo that has an inside diameter a bit smaller than the width of the intended line. Stuff cotton into the end of the bamboo and compress it rather tightly. Dip into ink or dye until a reasonable quantity has been absorbed. Wipe off the excess and start to letter. A piece of felt wrapped over the end of a flat stick such as a tongue depressor will work very well for large letters and can also be used with ink or dye.

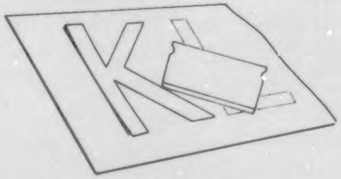
An excellent lettering pen can be carved from a piece of bamboo. Use a very sharp knife or a razor blade to carve the pen, and make certain the end is flat and uniform in thickness. These pens can be used with a variety of inks.



Cutout Letters



Cutout letters are easy to make. Colorful sets of plastic or cardboard letters can be purchased at art supply stores or bookstores. They can also be cut from paper, cloth of various colors and textures, cardboard or from wood. The letters can be copied or traced from a child's alphabet book, from an art book or a newspaper. When cutting letters out of paper or thin card, use a single-edged razor blade and hold at a 30 degree angle to the paper. If you have to use a double-edged blade, wrap a piece of adhesive tape around the fingers and thumb to prevent getting cut.



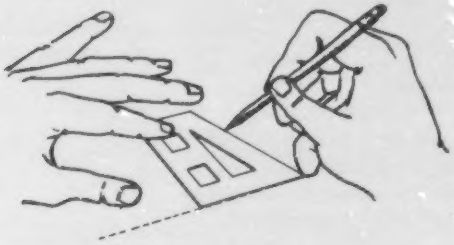
For special purposes, cutout letters can be combined in various ways. Two similar letters cut from different materials and slightly overlapped create an interesting effect. Letters can be more easily cut from two or more sheets of paper or light cardboard by temporarily fastening them together with rubber cement before cutting.

Stencil Lettering

Stencils provide a method of making neat, legible letters at low cost. Stencils can be made of many materials such as oiled cardboard, plastic or metal. Letter sizes can range from as small as ⅛" to several inches in height. Some stencils are used with India ink and special pens. Some are used with a stencil brush, felt-point pen, pencil or colored pencils.

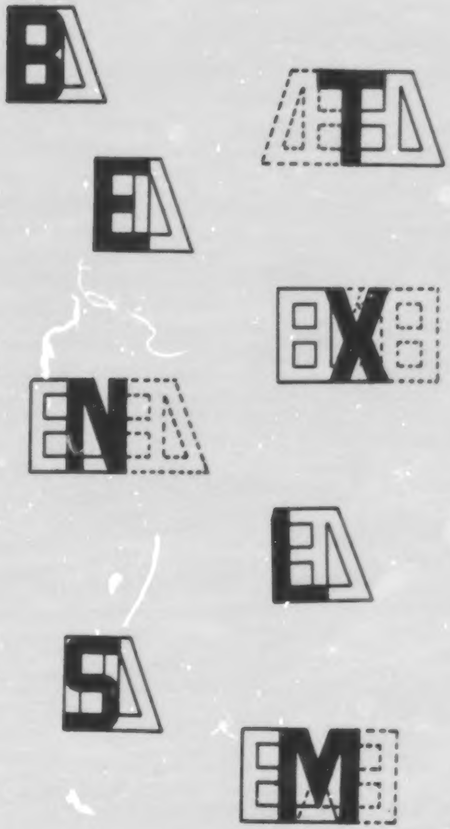
Unistencil

The unistencil is one of the simplest lettering devices for making large block letters or signs for posters, or for outlining letters which are to be cut from paper, cardboard or other materials. Three unistencils of different sizes are printed on a separate sheet in Appendix 7. These sheets can be mounted on cardboard and cut out for making two-, three- or four-inch letters.



The procedure is as follows:

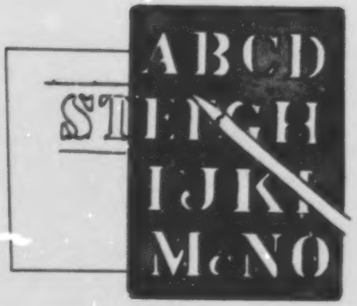
1. With a pencil, trace the basic form for each of the desired letters. The letters will be incomplete at this stage. The following samples show how various kinds of letters can be formed.



2. Complete each letter by cutting off or rounding corners and by completing the missing lines.

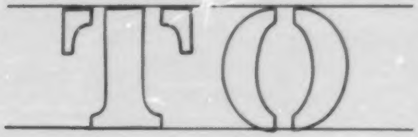
The letters can be cut out; or, if they are on a sign or poster, they can be filled in with ink, a felt-point marking pen or colored pencils.

Cardboard and Metal Stencils



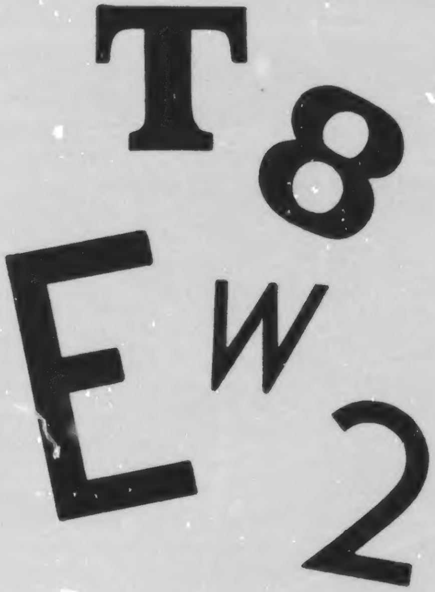
A wide variety of cardboard stencils are available at most bookstores. These vary in size from ½" to 2" or 3". They come in Gothic, Roman, Old English and other styles. Pick a style that is appropriate, but keep in mind that simple styles are usually more legible. To use cardboard stencils, follow these steps:

1. Draw guide lines lightly in pencil to mark the top and bottom of the letters.



2. Trace the letters lightly in pencil or use a marking pen or colored pencil.

3. Fill in with ink, paint, colored pencil or felt marking pen.

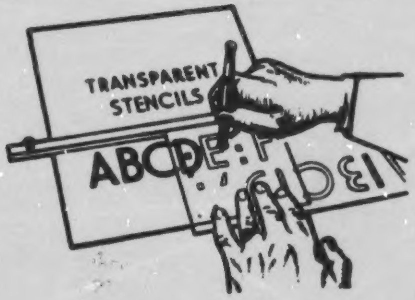


Large stencils are available in cardboard or in metal. These can be used in the same manner as smaller stencils, or they can be formed into words and painted with canned spray paint to create interesting lettering effects. Stencil brushes also can be used with these stencils.

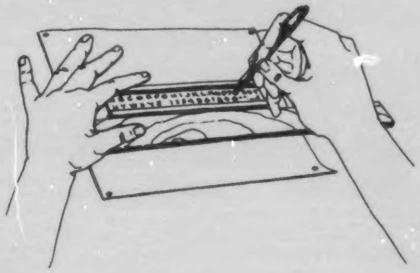
Plastic Stencils

There are two basic types of plastic stencils: thin flat stencils intended for use with a stencil brush, and thicker stencils for use with special pens. The latter have some provision for raising them above the lettering surface.

Thin, plastic stencils are used with a stencil brush and block water color paints. To use these stencils, dampen the brush and rub it on the paint until the brush is well charged and nearly dry. Hold the brush perfectly upright and with a circular motion brush over the letter being careful not to move the stencil. Light pencil guide lines help to keep lettering straight.



There are several different brands of guides for using India ink in special pens to make neat small letters for a variety of purposes. The procedure varies with the type of guide, but the instruction sheets do an adequate job of describing the procedure.



MOUNTING AND PRESERVING PICTURES

Pictures cut from magazines or other sources, maps and charts printed on paper, and photographs are likely to get damaged when handled frequently. To make pictures and charts last longer, they can be mounted on cloth, cardboard or heavy paper. Pictures can also be protected by covering with glass or clear plastic and binding with cloth or paper tape.

In addition to providing protection, mounting makes pictures or small objects more attractive and easier to use. The method of mounting will be determined in part by the intended use. Is it to be held up in front of a small group? Is it to be handled extensively? Will its use be temporary or relatively permanent? These questions need to be answered before deciding the type of mounting to be used. If planning to mount many illustrations in a picture file so they will last longer and can be handled without damage, try to standardize the size of the mount. This will make storage easier.

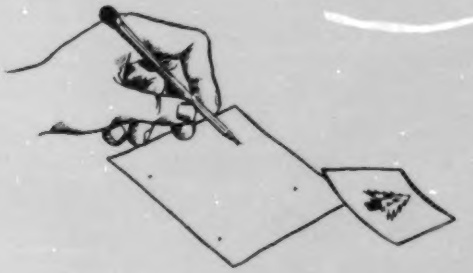
No matter what process is used to mount pictures, take the time and care necessary to make the mount neat and clean. The extra work is well worth the effort in its effect on an audience.

Paste or Gum Mounting

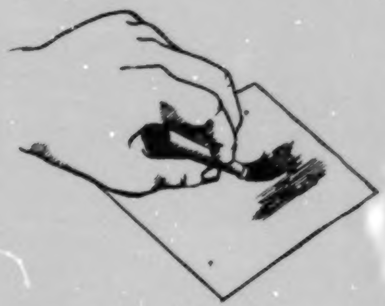
Paste or gum mounting is satisfactory for mounting magazine illustrations or photographs onto heavy paper or cardboard. Commercial white paste or gum arabic can be purchased in almost any book or stationery store. In the few cases where such adhesives are not readily available, a flour and water paste, of either commercial wheat or cassava flour, can be mixed for an equally good adhesive. When mixing paste, first, be sure all lumps are smoothed out. Second, since flour is a favorite food for insects, add a small quantity of insecticide to the paste—an important precaution in areas where insects are prevalent. DDT powder works fine, but don't use a liquid insecticide because the petroleum base is likely to damage the picture. Exercise care when using and storing paste that has been treated with insecticide, particularly around children. They sometimes eat paste.

The steps for mounting with paste or gum are relatively easy.

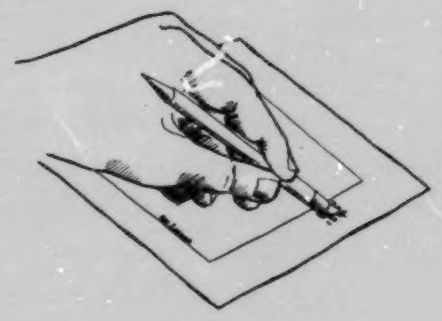
1. With a pencil, mark the cardboard or paper lightly where the picture is to be located. As a general rule, side margins should be of equal width, and the bottom margin should be slightly wider than the top.



2. Apply adhesive to the back of the picture with a wide brush or a piece of stiff cardboard. Use only enough to cover the back of the picture adequately.



3. Carefully place the picture on the mount. Cover it with a clean piece of paper and rub down carefully.
4. Remove any excess adhesive, allow it to dry, and erase any pencil lines that show.



Although using a paste or gum adhesive is a reasonably satisfactory method for mounting pictures, these adhesives may dry out in time which may cause the picture to come off the mount. Also, they change color with age, the result being some discoloration of the picture.

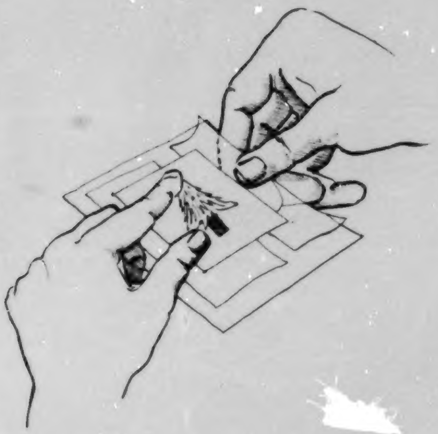
Rubber Cement Mounting

Rubber cement is one good adhesive for mounting pictures. Tire patching cement and shoe repair cement can also be used, and are available in most countries. These adhesives are relatively permanent and easy to use. If rubber cement cannot be purchased, it can be easily made in areas where raw rubber is available. The formula is given in Appendix 4.

For a temporary mount, the steps in rubber cement mounting are similar to those for paste mounting, but the procedure for a permanent mount is a bit different. For the latter, the adhesive must be applied to both the picture and the mount. The steps are:

1. On the cardboard or backing paper on which the picture is to be mounted, make light pencil marks to indicate where the picture is to be located on the mount.
2. Coat the back of the picture and the front of the mount with a thin layer of cement. Use a brush or piece of card. Be sure to cover both areas completely. Try to avoid excess amounts of cement beyond the picture area.
3. Allow the rubber cement to dry completely.

4. Before letting the picture touch the mount, be sure it is positioned accurately since the two rubber cemented surfaces will stick tight on contact. This step can be facilitated by using two pieces of waxed paper such as a waxed bread wrapper. Cover the cemented surface of the mount with the pieces of waxed paper and move the picture until it is in exactly the proper position on the mount. Then carefully slide out the waxed paper. Finally, cover the picture with a sheet of clean paper and rub down carefully, working from the center to the edges of the picture.



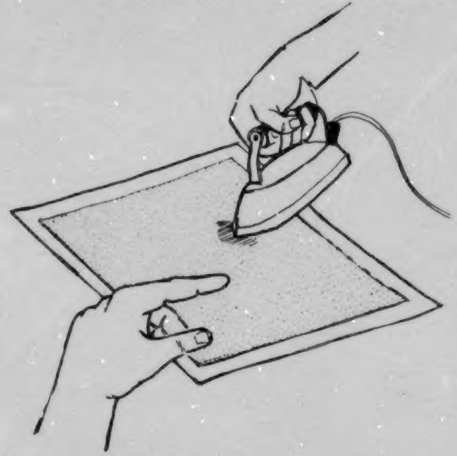
5. Remove any excess cement by rubbing the cement into a ball with a finger. Be certain fingers are clean to avoid smearing.

Dry Mounting

Dry Mounting is a simple, fast procedure for mounting pictures or photographs in countries where dry mounting tissue can be obtained.

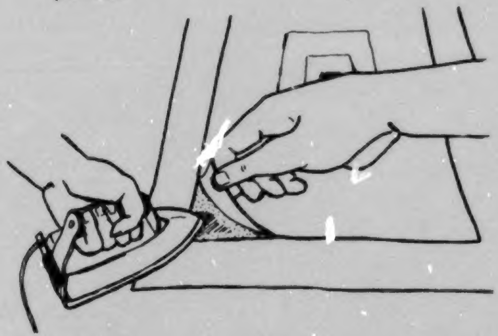
In the dry mounting process, a sandwich is made of the picture, tissue, and mounting paper or cardboard. Then pressure and heat are applied. A regular household electric iron or an iron heated on a stove or with charcoal can supply the heat. The steps are:

1. With the tip of an iron, tack a sheet of mounting tissue to the back side of the picture. Tack in the center. Special tacking irons are sold for this purpose, but a household iron works equally well.

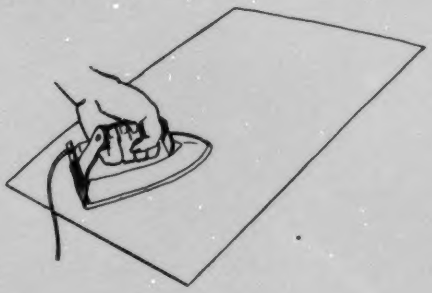


2. Trim picture with attached tissue to the desired size with a razor blade and ruler or straight-edge.

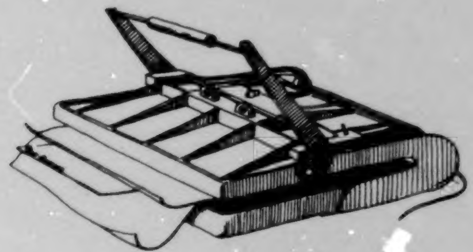
3. Position the picture and tissue carefully on the mount. Lift lower left hand and upper right hand corners of the picture and tack the tissue at these points.



4. Cover the picture with a clean sheet of paper and rub it with the household iron. When an electric iron is used, set the temperature of the iron to rayon heat. Covering prevents direct contact of the iron and picture, which can cause the ink with which the picture was printed to melt and smear. The heat adheres the picture, tissue, and mount.



Heat can also be applied with a dry mounting press which is faster and more convenient, particularly when much dry mounting work is to be done.



Wet Mounting

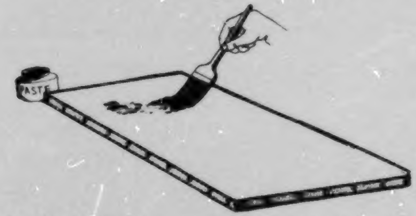
The wet mounting process is useful for mounting paper maps, charts or other pictorial material onto cloth. The process is called wet mounting because a water-base paste is used as an adhesive. Materials that have been mounted on cloth can be handled repeatedly and rolled or folded for storage with little chance of damage. To wet mount, the following materials are needed:

1. Wheat, rice or cassava flour (or a similar substitute) to make a paste. Put the flour in a jar with holes punched in the lid. Crushed moth balls can be added to keep insects from eating the paste.
2. A wide paint brush for mixing and applying paste, and a shallow pan for mixing.
3. Unbleached muslin, baft or old flour sacks, for the cloth backing.
4. Thumb tacks or drawing pins for attaching the cloth to the mounting board.
5. A wooden rolling pin or a smooth bottle to roll the mount smooth.
6. A bowl or similar container for soaking the backing cloth.

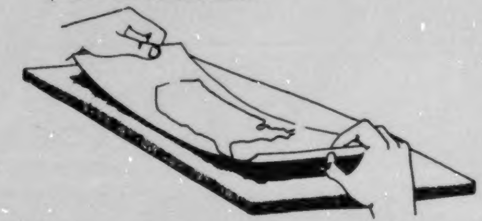
A flat surface on which to do the mounting is needed. A table is ideal, but remember that paste and pins will damage the surface. A piece of thick plywood makes a good working surface. Two coats of waterproof varnish or shellac will prevent the cloth from sticking to the board. The following steps outline the wet mounting process:

1. Pour about one-half cup of water into the mixing container. Sift in the flour, stirring it with the brush. Mix it carefully to prevent lumps from forming. Add flour until the paste is thick enough to spread easily.
2. Wet the cloth thoroughly. New cloth will resist water, so be sure it is completely wet. Wring out to remove excess water.
3. Lay the cloth on the working surface and smooth out the wrinkles. Fasten one corner with several thumb tacks or drawing pins. Stretch the cloth keeping the threads straight, and fasten two adjacent corners. Fasten the cloth at the middle of each side keeping it stretched tightly. Complete pinning of each side by working from the center to each corner. Space the pins about six inches apart.
4. Place the material to be mounted on the smoothly stretched cloth and mark the corners with pencil.
5. Next, place the material to be mounted face down on a smooth surface and moisten the back with water by using a sponge or piece of cloth. The material should be completely saturated so that it lies flat.

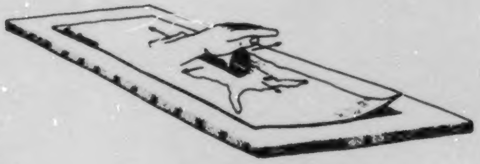
6. Apply paste with a wide b[illegible] to the surface of the stretched clo[illegible]ending beyond the pencil marks. [illegible] sure the paste is spread evenly and there are no lumps. Work rapidly so that neither paste nor material can dry out.



7. Carefully lift the material and place it in position on the cloth. If the material is large and difficult to handle, fold it loosely, paste-covered sides out, before lifting it to the paste-covered cloth. Working from the center toward the edges, smooth carefully. Take care to avoid tearing the soft paper or getting paste on its surface.

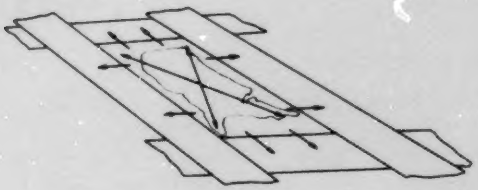


8. Use a rolling pin or round bottle as a roller to smooth out excess paste and to make a permanent mount. A set pattern of rolling will reduce wrinkles and air bubbles. Roll from the center to one end of the mount. Then roll from the center to the opposite end and follow by rolling from the center to the top and from the center to the bottom.



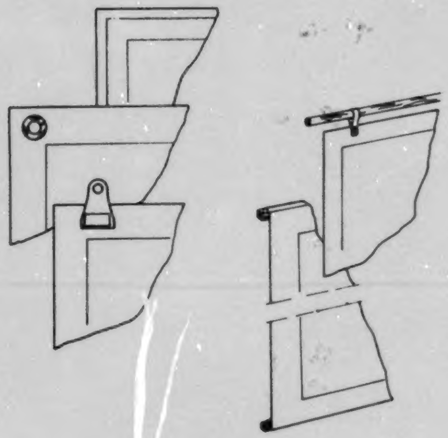
9. Lift the corners to relieve tension built up during rolling.

10. Roll from the center to each corner. The rolling pattern should form an X. Roll carefully from the center toward the edges. As you roll the edges, avoid getting paste on the roller. Clean paper strips placed over the edges of the map or chart will prevent paste from getting on the roller. When the rolling is completed, remove the paper strips and wipe off any excess paste with a damp cloth.



11. Allow to dry completely before removing it from the working surface.

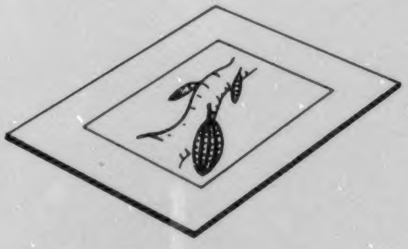
The edges of the cloth mount can be finished in several ways to make a neat edging. If cloth-backed charts are to be used outdoors, the edges can be strengthened by folding the edge over a piece of heavy string and sewing it in place.



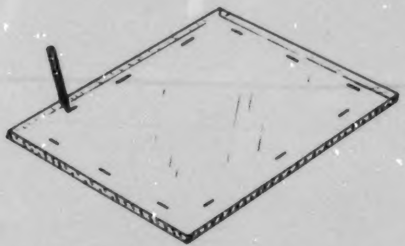
Tape Framing

Flat pictures or small objects that need protection can be framed with glass or clear plastic and tape. Carefully done, this is an attractive way of displaying magazine pictures, photographs, or various kinds of certificates. Framing protects as well as improves the appearance of visuals. Materials needed are a piece of glass or plastic; a piece of cardboard slightly larger than the material to be framed; and paper or cloth tape at least a half-inch wide. The process of mounting a picture is as follows:

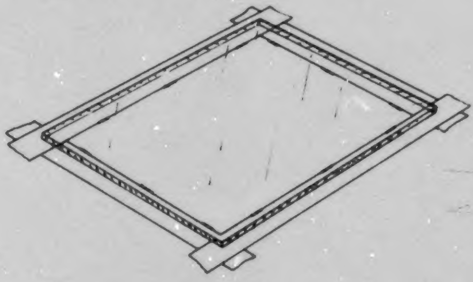
1. Mount the picture on the cardboard with paste or rubber cement.



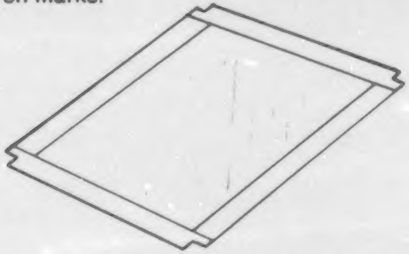
2. Mark the glass with a crayon about a half-inch from each of the four edges.



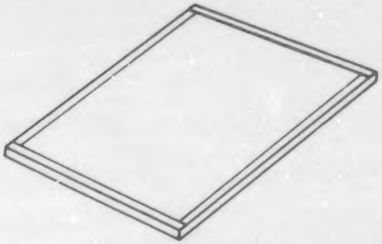
3. Place the glass with the marked edges down. Apply tape to each side, using the crayon marks as guides. A small, wet rag or sponge is good for moistening gummed paper tape.



4. Turn the glass over, trim the edges of the tape, and cut the corners as shown in the diagram. Then, wipe off the crayon marks.

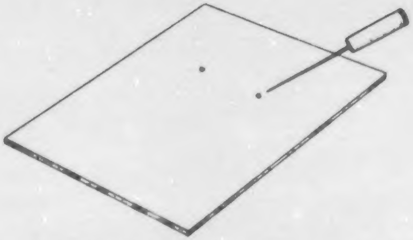


5. Again turn the glass over, place the mounted picture face down on the glass, and carefully fold the tape around the edges of the glass onto the cardboard.

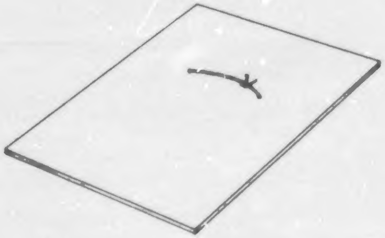


Colored tape can be used or paper tape can be painted with water colors. The finished mount can be displayed on an easel or, before framing, a string can be attached to the cardboard backing so the picture can be hung on the wall. To attach a string to the cardboard backing, follow this procedure:

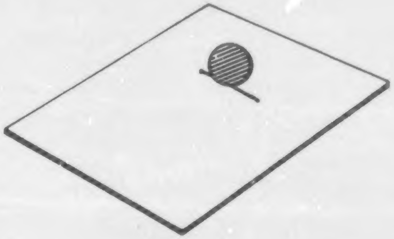
1. With an awl or some other sharp tool, make two holes through the cardboard backing about two inches apart and a third of the way down from the top of the mount.



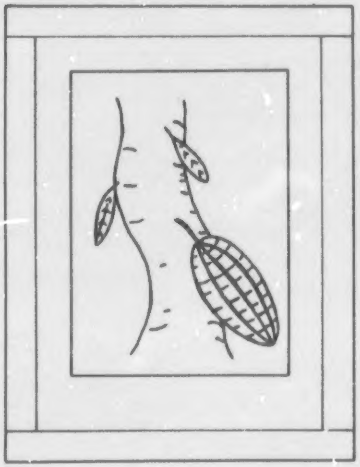
2. Thread string or cord through the holes and tie with a square knot on the back side of the backing. Make the loop short enough so it does not show above the backing. Cut off the excess cord and pull the knot tightly against one of the holes.



3. On the inside of the mount, flatten the cord with a coin or some other smooth, hard object.



4. Cover with tape to prevent the cord from slipping.

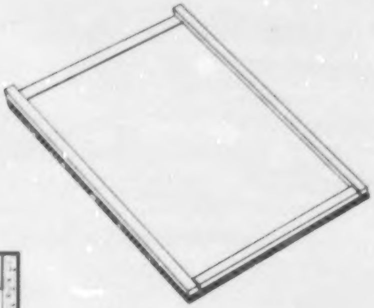


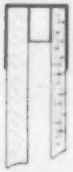
A picture can be mounted on a separate piece of heavy paper or thin card. Since paper can be obtained in many colors, this permits a wider choice of backgrounds.

A frame that is open at one end can be made which makes it possible to remove and replace a picture. The procedure for making an open-ended mount is similar to that previously described. In addition to the glass, cardboard backing, and tape, several strips of cardboard about ¼" wide are needed:

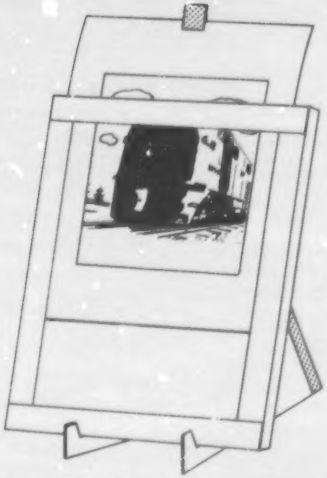
1. Cover one end of the backing and one end of the glass with tape.

2. Glue strips of cardboard to the remaining three sides of the backing. These strips will act as spacers to separate the backing from the glass. Then, tape the glass and cardboard together on these three sides.





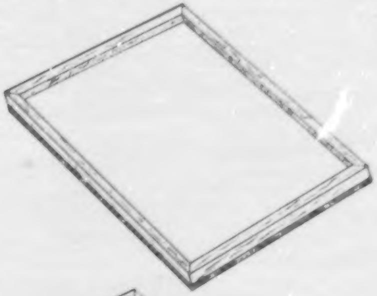
The finished frame can be displayed on an easel. Fasten a small piece of tape to the pictures to make them easier to remove from the frame through its open end.

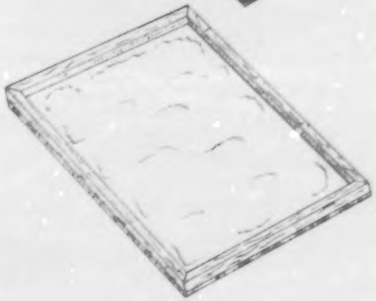


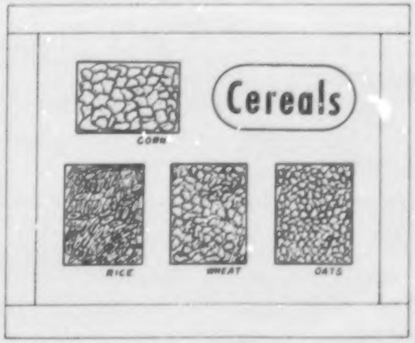
Mounting three-dimensional objects such as seeds, butterflies, cloth or mineral samples is similar to mounting a flat picture. Wood or cardboard spacers must be placed between the glass and cardboard to make room for the objects or specimens being framed and to prevent cracking the glass. The cardboard spacers can be made by gluing or cementing several cardboard strips together. The thickness of the spacers will vary according to what is being framed. Cement the wood or cardboard spacers to the backing.

Absorbent cotton can be used under the objects or specimens to hold them in place. If specimens such as butterflies, moths, etc. are being framed, add a few moth crystals to prevent their being eaten by live insects. A cardboard mask can be used to frame the objects. Place the objects in position, cover with glass, and tape the mount by using the same procedure for framing flat pictures.

Many kinds of objects can be taped-framed. Use ingenuity to discover new materials to mount or new ways to make the mounts more attractive.







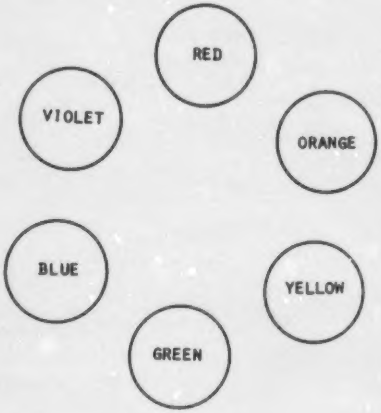
COLORING

Color Choice

Color adds significantly to many visual materials. Bright colors attract attention and add interest to signs, posters, bulletin boards, displays, transparencies and other materials. Properly used, color can improve, identify and relate specific elements of a visual. Color choices depend on several factors:

- **Personal preferences.** Color usage depends to a large extent on personal preferences, which vary with age, sex and culture. In general, young children seem to prefer bright colors, but this may not be universal. One can run a simple test to determine color preferences. Take swatches of a half-dozen different common colors and ask a sampling of the audience to arrange them in order of preference.
- **Color meanings.** Different colors mean different things to different people. Consider carefully what these meanings are when making color choices. In most Western cultures, dark colors such as dark blue, purple or black tend to be related to grief or doom. Red, orange or yellow tend to be related to happiness. These associations may or may not hold true in other cultures. Colors may also be associated with political parties, geographic regions or social groups. Careful observation and a few questions are helpful to determine what associations an audience makes to various colors.

  Choose colors with positive associations for the positive parts of a message and colors with negative associations for the negative parts of a message. For example, when contrasting the right and wrong way of doing something, use colors with positive associations when showing the right way.
- **Color contrast.** When emphasizing a particular part of a visual, use colors that contrast with other colors in the visual. For example, should a display be composed largely of gray tones, use a bright red or blue to emphasize the center of interest. Consider a color wheel such as this one:



Any color on the wheel will contrast with its opposite—green will contrast with red, orange with blue, and violet with yellow. To heighten the contrast, one of the colors should be much lighter than the other. For example, light red will stand out against dark violet. Although a simplified approach to color contrasts, it is adequate for general use. Research has shown that the following color combinations provide good contrast and legibility:

white and black
black and yellow
yellow and violet
violet and orange
orange and light blue
light blue and red
red and buff

- **Color harmony.** To relate parts of a visual to each other, use colors that harmonize. Colors that are near each other on the color wheel, such as blue and blue-green, or red, orange, and yellow, usually go together well. The lightness or darkness of each color, as well as its saturation, also affects harmony, but such complications are not important for most teaching materials.

In summary, when choosing colors, pay attention to the audience's likes and dislikes and to its color associations. To separate elements in a visual or to emphasize a particular item, choose colors that contrast. To relate several elements of a visual, choose colors that harmonize. Color combinations, like illustrations, should be kept simple. A few colors carefully used will be more effective than quantities of color used haphazardly.

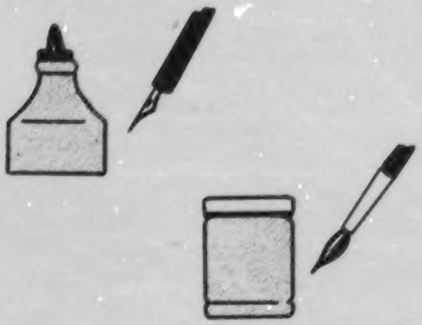
Coloring Techniques

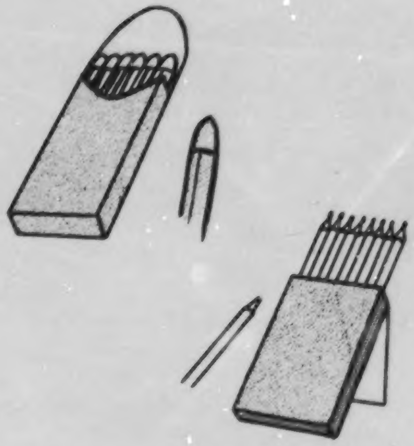
Coloring materials used in making visual materials fall into two major categories: those for transparencies, and those for presentation and display media.

Transparencies on clear acetate can be colored with felt-point markers. Some varieties work better than others. See what is available and try these on the materials being used.

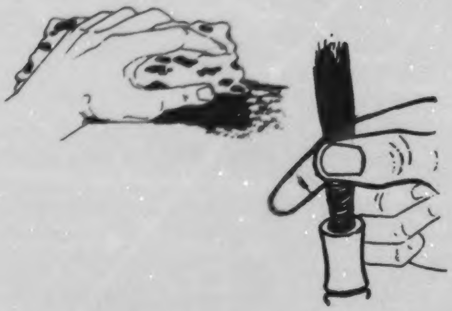
Perhaps the easiest dyes to obtain are food colors; however, most transparent water colors in liquid or dry form can be used. Some transparent colors in cake form, like children's watercoloring sets, have fine particles of clay in them that do not show when put on paper or cardboard, but do show as tiny specks when used on transparencies.

Colors can be diluted with water and applied with a brush or with a cotton-tipped applicator. When using clear photographic film, work on the coated or emulsion side of the film. Use enough dye and allow sufficient time for it to penetrate the emulsion. To prevent uneven coloring, excess dye should be blotted with a piece of soft paper. A wide variety of colorants can be used for opaque materials. The best choice will depend primarily on what is available. Powdered, solid or liquid water colors, colored inks, dyes, crayons and colored pencils—all can be used for coloring posters, signs, flannel board materials, elements of display, and many other articles. When visuals will be subjected to the weather, use oil or plastic-base paints.

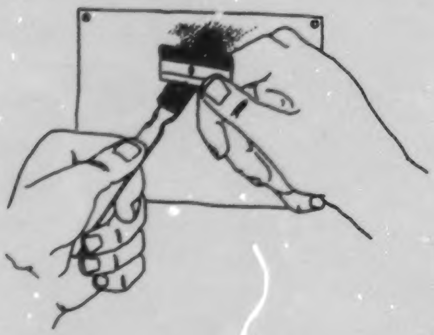




If commercial coloring materials are not readily available, use dyes and pigments obtainable in the market. They will often work equally well at less cost. Some suggestions for making dyes and paints are included in Appendix 4.



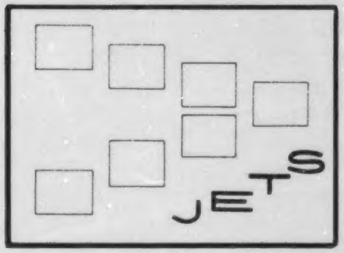
Brushes are the best way to apply paint or ink, but a dauber made by stuffing a wad of cotton into the end of a bamboo rod also can be used. Brushes can be made from raffia, bamboo or chicken feathers. Spray cans are great, if available, but they are expensive. A sponge or a toothbrush can be used for textured effects. The sponge is dipped into the colors and then daubed on the surface to be colored. With a toothbrush, dip the brush into the color and then draw a piece of cardboard across the bristles so that the paint or ink flies off creating a textured pattern.



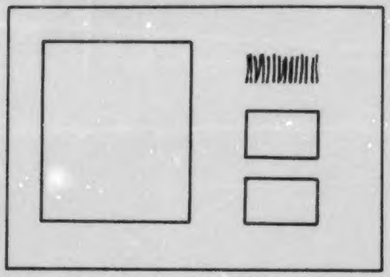
DESIGN

Careful arrangement of the verbal and visual elements of an instructional material can focus the attention of the audience on the elements to be learned. There are five factors that should be considered with designing materials:

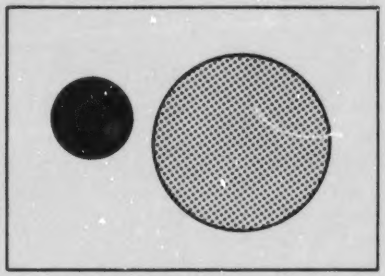
- **Simplicity.** Words that do not contribute to better understanding or pictures that are not related to the ideas being communicated should be eliminated.
- **Pattern.** The parts of visual materials should be arranged in a pleasing way. There are no absolute rules for making an attractive layout, but following a pattern of some kind is one guide. The layout can be based on a geometric shape, a letter, a number or even the shape of a map.
- **Balance.** Balance is the relationship between the various parts of a visual. Formal balance is achieved by placing similar materials in rows. Informal balance combines materials of various sizes and shapes.



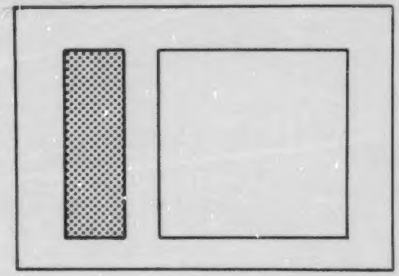
Several small elements will balance a large shape.



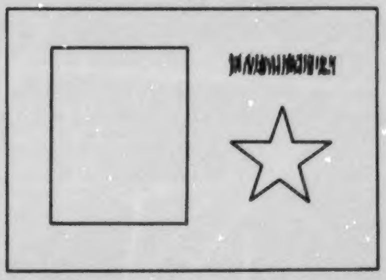
A small, dark object will balance a large, light object.



A small, textured area will balance a large, plain area.



A small, irregular shape will balance a large, regular shape.

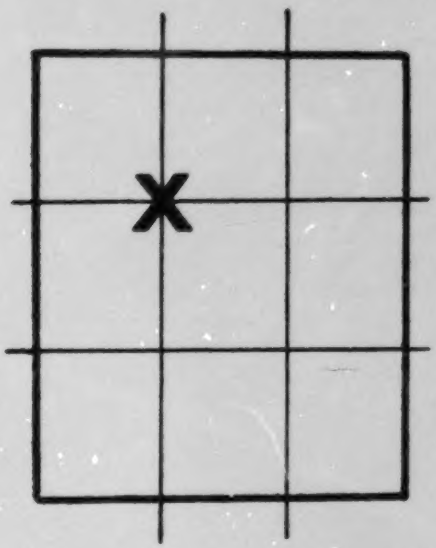


A word is seen as a word because of the ratio of space between the letters as compared with the space around the group of letters. Sentences are seen as sentences and paragraphs as paragraphs because of the balance of space around them as compared with the space within them. Similarly, two or more closely related pictures or a picture and its caption should be seen and read together.

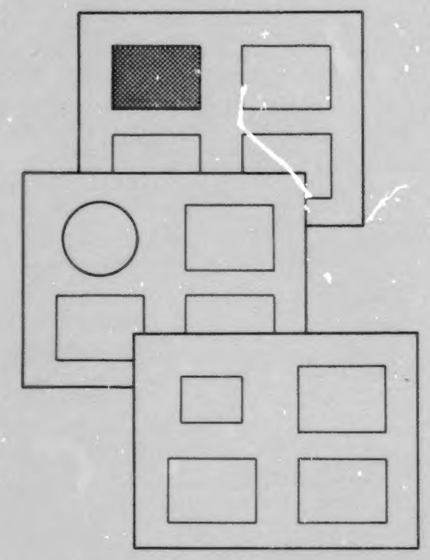
The balance of background space to illustration or to words is an important consideration in designing a display or poster or a printed page.

Generally, there would be more space at the bottom of a page, an illustration, or a group of illustrations than at the top.

- **Emphasis.** The more important elements of a visual should stand out. In placing key elements of a visual, follow the rule of thirds. Divide the page, bulletin board or poster area into thirds, horizontally and vertically. The intersections of these lines mark the points of greatest interest—the points where important words or visuals should be placed.



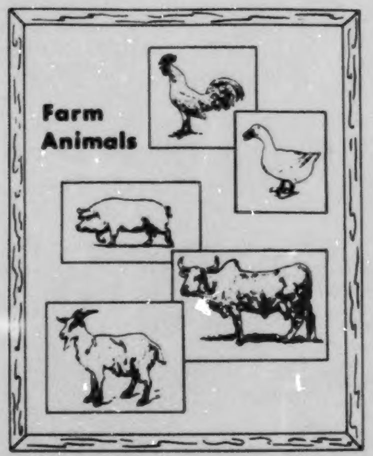
Important elements of a visual can be emphasized by making them stand out from their surroundings. This can be done by making such elements different in size, shape, color, texture or position.



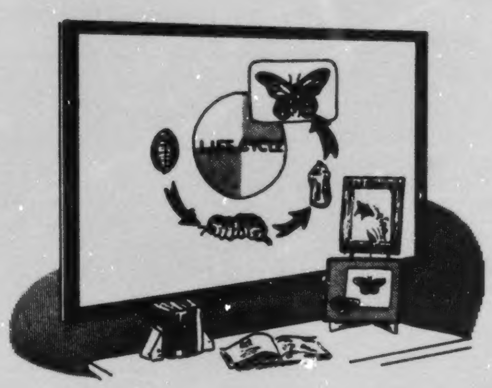
- **Harmony.** The elements of visual materials should blend in a pleasing manner. Formal lettering should be used with formal layouts and informal lettering with informal layouts. A minimum number of colors that go together well should be used.

The shapes of the various elements should be harmonious. A good general guide to follow is to use related elements and then, by careful arrangement, relate the elements used.

Materials should be built around one idea, a few easily understood visuals, and a minimum of words, and these should be carefully arranged. In any area involving creativity, there are no hard and fast rules based on research. This is especially true when working in cultures with highly developed traditional art forms.



The suggestions on design presented here are but a beginning on which to base decisions.



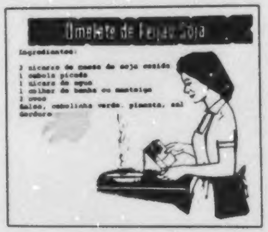
DUPLICATION

For duplicating instructional material there are many techniques ranging from processes that make one copy at a time to elaborate printing processes that produce thousands of copies per hour. Four relatively inexpensive basic processes will be described here.

Transfer Processes

In transfer processes a dye image is produced on a master sheet by typing, writing or drawing. This image is then transferred to consecutive paper copies with a hectograph or spirit duplicator. Several different color dyes can be used on the same master for multiple color work. Copies are inexpensive to produce and are reasonably durable although the image will bleach if exposed to bright sunlight for extended periods of time.

Transfer processes are suitable for inexpensive production of limited quantities of newsletters, leaflets, instruction sheets, or classroom assignments or tests. They are also ideal for producing prototype copies of leaflets or pamphlets. The inexpensive copies can be used for field testing with a sample of the audience before going into mass production.



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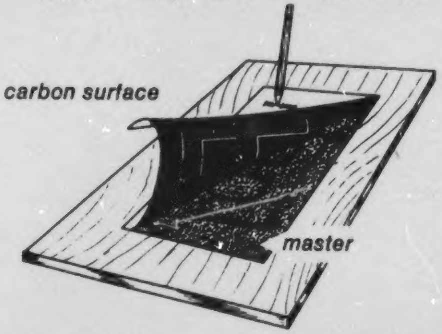
Hectograph

With the hectograph process, a dye image is prepared on a master sheet, transferred to a gelatin surface, and then transferred to the copies. Twenty to thirty good copies can be made on paper or cardboard. There are four basic steps in the process.

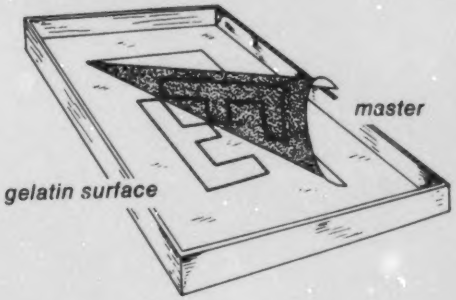
1. Preparing the transfer pad. To make a transfer pad, a flat pan, such as a cookie sheet, or a shallow wooden box is needed. The pan should be slightly larger than the copies to be made. Prepare the transfer compound by combining one box of unflavored gelatin and one pint of glycerin. The mixture is boiled for about seven minutes. Any scum is then skimmed from the surface, and the mixture is poured into the pan and allowed to set for about 24 hours. Other formulas for preparing transfer pads are included in Appendix 4. Inexpensive kits that include a pan and the gelatin compound can be purchased in many places.
2. Preparing the master. Using hectograph ink or special hectograph pencils, draw what is to be duplicated on a sheet of paper. A glazed or hard-surfaced paper works best. Soft papers, like newsprint, absorb too much dye. Hectograph inks are available commercially or can be made as described in Appendix 4.

   Hectograph "carbons," which strictly speaking are not carbons at all, also can be used.

   They are made of paper-coated materials with a waxy substance impregnated with aniline dye. The most common colors used are purple, blue, red, green and black. When using a "carbon", place it face down on the master paper and write, draw or type on the back of the "carbon." This will form an image on the master that is right reading. Hectograph ribbons are also available for typing directly onto the master sheet.

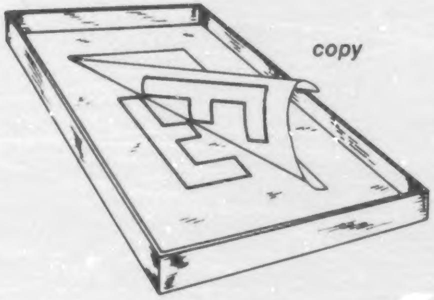


3. Transfer the image to the transfer pad. Prepare the gelatin surface by wiping gently with a wet sponge that has had the excess water squeezed out. When the surface is thoroughly dampened, smooth the master sheet, dye side down, on the transfer pad. In four to six minutes, the dye image will have transferred to the gelatin. Then, carefully remove the master.



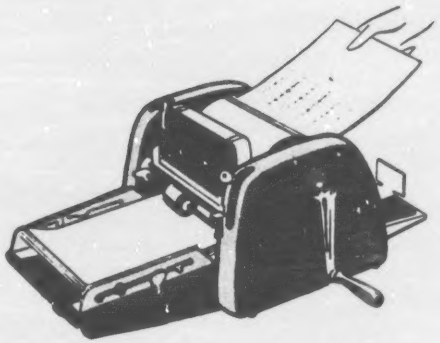
BEST COPY AVAILABLE

4. Making the copies. Smooth a sheet of copy paper over the image on the gelatin, allow to transfer for five to ten seconds, and remove carefully. Continue making copies, allowing increasing transfer time as successive copies are produced. Any paper can be used as copy paper, but glazed surface works best because less dye is absorbed by the paper fibers.



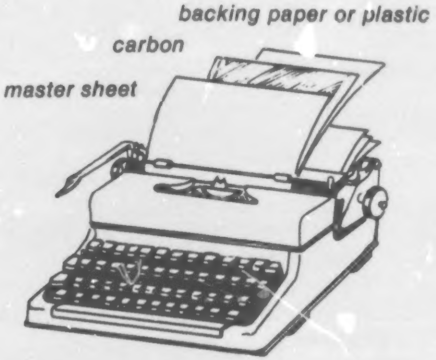
When the desired number of copies are completed, wipe the surface of the gelatin with the damp sponge and cover with a piece of paper. Don't use hot water, because the gelatin surface will melt. The remaining dye image will transfer partially to the paper and the rest will be absorbed in the gelatin. The following day it can be used for duplicating another master. The gelatin compound can be recooked to destroy the old image or to remove surface blemishes.

Spirit Duplication

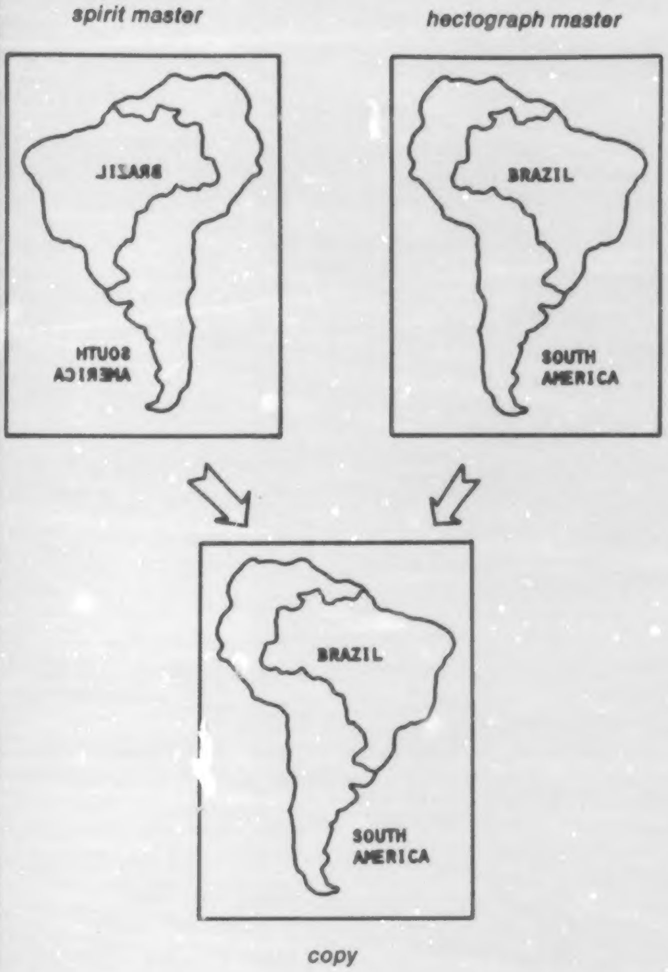


Basically, spirit duplication is similar to hectograph but is a mechanical process employing a duplicating machine. It is faster and cleaner than hectograph. Over 100 copies can be made from one master sheet. To make copies, a master sheet is placed on the drum, image side out. The paper tray is loaded, alcohol and feed controls are turned on, and the drum is turned by a crank. Each time the drum revolves, a sheet of paper is picked up, dampened with alcohol, and pressed again the master to make a copy. The darkness of the copies can be controlled by regulating the flow of alcohol, the pressure of the copy paper against the master, and the speed of the machine. Specific instructions come with the machines; and, in most cases, are printed on the body of the machine or on one of the paper trays.

Preparation of masters for spirit duplicating is the same as for hectograph except for one important difference. The dye image must be wrong reading. Most masters for spirit duplication are made using "carbons." Place the master sheet on top of the carbon and write, type or draw on the master sheet. This produces a reverse-reading, dye image on the other side of the master sheet. When using hectograph ink or pencil, the image must be drawn in reverse.



There are several techniques that can be used to correct an error when preparing the master for either hectograph or spirit duplication. If, for example, extra letters or some unwanted materials have been typed on the master, they can be cut out with a razor blade or small scissors. Also, such errors can be covered with a small piece of thin tape. When an error needs to be corrected, use a razor blade to scrape off the dye image containing the error. Then, place a piece of unused "carbon" where the dye image has been scraped off (that is, where the error was), and type in the correction. Material that has been written or drawn on the master can be removed or corrected in the same manner.



Stencil Processes

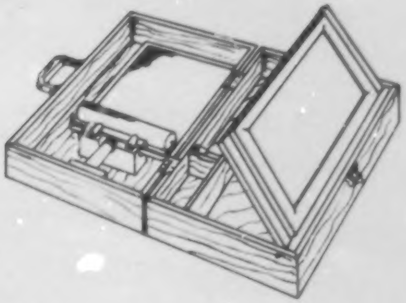
The simpiest method of stenciling involves cutting openings in a material such as oil stencil board, ordinary thin cardboard, wax paper or heavy wrapping paper, and brushing the ink or paint through the openings with a fairly dry stiff brush. A wet brush will allow the ink or paint to run under the edges of the openings. Stencil processes are limited to shapes or to large or bold letters because it is difficult to retain the center openings in letters such as A, B, D, O, P, Q, and R. The production of multiple copies is slow. More sophisticated stencil processes are stencil duplication and silk-screen printing.

Stencil Duplication

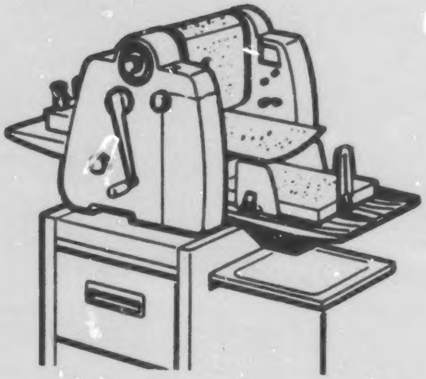
Stencil duplication is more commonly known as mimeograph or cyclostyle. In this process a stencil is prepared on a thin, open-fibered paper coated with a waxy substance. Ink is forced through the stencil to print multiple copies on paper. Several thousand copies can be made from a stencil. Different colors can be used by making a separate stencil for each color and re-running copies through the duplicating equipment. Stencil duplication is ideal for making newsletters, leaflets, pamphlets or small newspapers when the quantity needed is limited to a few thousand copies. Basically, stencil duplication is a two-step process.

1. Prepare the stencil. Place a stencil on a hard smooth surface. Type, write or draw with a ball point pen or stylus. Stencils are available commercially at varying prices. The better stencils will produce more and sharper copies. Detailed instructions for use come with

each box of stencils. Electronic stencil cutters have been introduced in recent years that are ideal for making special stencils from drawings or combinations of drawings and typing. These are, however, expensive and not readily available.



2. Make the copies. Copies can be made using a simple silk screen, a portable duplicator, or a duplicating machine. Plans for making a portable duplicator are included in Appendix 5. To make copies with a simple screen or portable duplicator, the stencil is taped to the screen and a paste duplicating ink is rolled across the surface with a soft rubber roller. This produces satisfactory copies, but is slow. For improved quality and speed, a stencil duplicating machine is ideal. Such machines resemble a spirit duplicator in outward appearance but are quite different in operation. Specific instructions for attaching the stencil and running copies come with each machine.



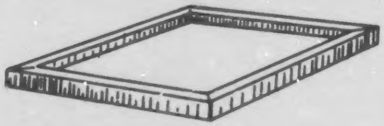
The paper for making copies by stencil duplication must have a soft, porous surface that will absorb ink. Such paper is sold under various brand names. Stencils can be saved for re-use by placing them in a folder or newspaper or other soft paper.

Silk-Screen Printing

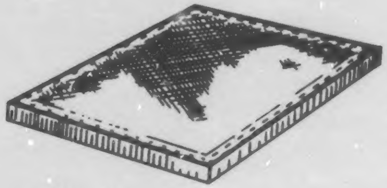
The silk-screen process is an inexpensive, relatively simple printing method for producing posters, charts, signs, leaflet or booklet covers and similar materials. Printing can be on cheap paper, cardboard, cloth, plastic, wood or practically any other material. Multiple-colored images can be made by cutting separate stencils for different parts of a visual and printing each one with a different color paint.

All that is needed to do simple silk-screen printing is a silk-screen frame hinged to a plywood base, a squeegee, and a few readily available materials. Frames can be purchased ready to use from art supply stores or can be constructed following these general guides.

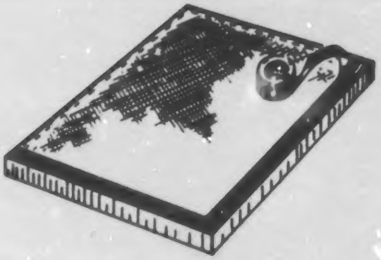
1. Construct a frame slightly larger than the largest poster you plan to make. Use pieces of hard wood about 1¼ inches square.



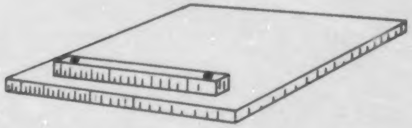
2. Cover the frame with silk, organdy or nylon. The cloth should be stretched tightly and stapled to the frame.



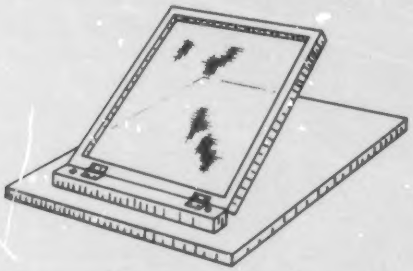
3. Cover the edges of the silk and the staples with strips of gummed paper tape. Painting the tape and the inside edges of the silk with shellac will make the screen last longer.



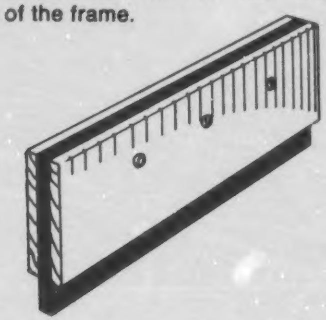
4. Make a base, slightly larger than the screen, from plywood and attach a wooden block at one end. This block should be the same height as the strips used to make the frame.



5. Fasten the frame to the base with pin hinges. This allows easy removal of the frame for cleaning, to change the cloth when it is damaged, or to use several different screens.

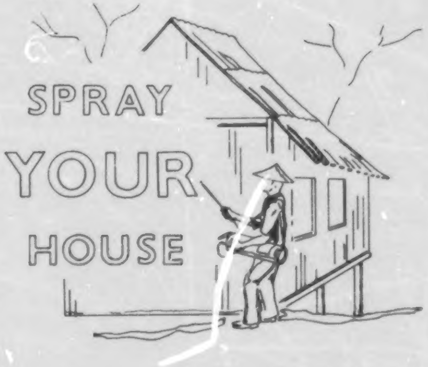


A squeegee can be purchased or made by bolting a piece of flat rubber ¼ inch thick between two pieces of wood. The squeegee should be a little shorter than the inside width of the frame.

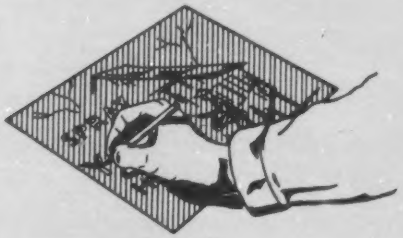


There are seven basic steps to making a one-color silk-screen poster:

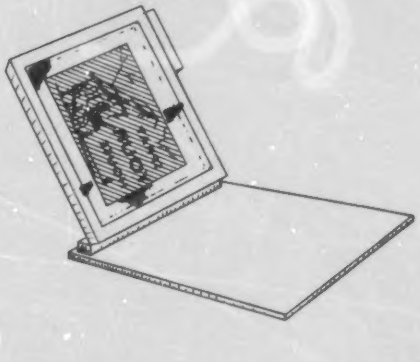
1. On a sheet of waterproof paper such as the lining of a cement bag or heavy food wrapping paper make a pencil or ink drawing of the design to be silk-screened.



2. Cut the design out of the paper with a sharp knife or razor blade.

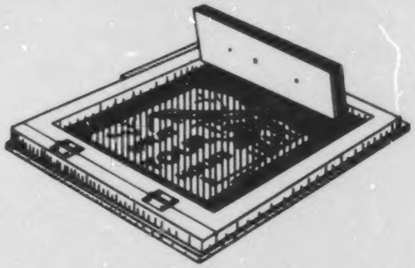


3. Attach the stencil to the underside of the screen wire tape. The centers of letters such as D and O can be attached to the screen with a small loop of tape. If there are any open areas of the screen showing at the edges, these can be covered with tape to block the paint.

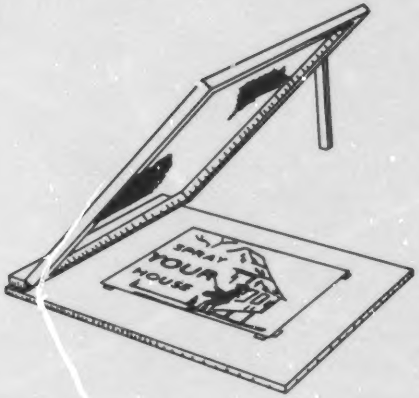


4. Place a piece of paper or cardboard in position on the base and lower the screen.

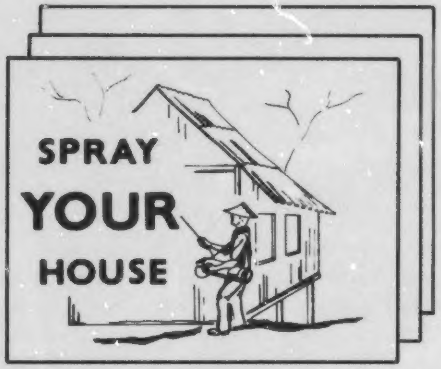
5. Pour a small amount of thick water-base or oil-base paint at one end of the screen and spread the paint across the screen with the squeegee.



6. Raise the screen and remove the printed poster. By repeating the procedure additional copies can be quickly made. A paper stencil will make as many as 50 copies depending on the paper used for the stencil.



7. When the required number of copies has been run, remove and discard the stencil. Excess paint can be wiped off and the screen washed ready for use with another stencil. A solvent such as turpentine is used for washing oil-base paint off of a screen. Proper cleaning is essential if a screen is to be re-used.



Stencils can also be made by the wax and glue method.

1. Make a pencil sketch of the poster to be printed. Trace this design on the silk with a soft pencil.
2. Paint the design on the silk with melted paraffin. A liquid wax called tusche is ideal for this purpose and is available from many art supply stores.
3. Paint a second coat of wax to assure a solid image.
4. Pour liquid glue at one end of the screen and spread it across the entire screen with a piece of cardboard.
5. When the screen is dry, turn it over and wash the wax or tusche out with turpentine or other wax solvent. The screen is then ready to print.

Since the liquid glue is not waterproof, such stencils should be printed with oil-base paints. Shellac can be substituted for glue for printing with water-base paints.

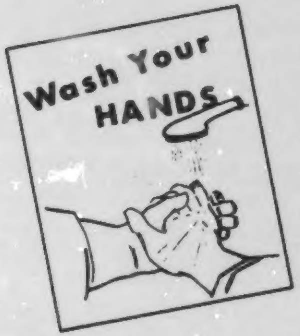
There are many other methods of making stencils for silk-screen printing. For high quality and large quantity runs, stencil films that are soluble in water or lacquer thinner are generally used. These are available in many places. Check with a local printer to see what he is using.

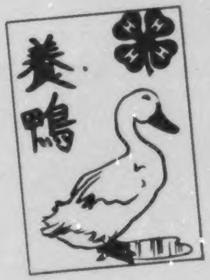
Silk-screen paint may be purchased commercially or can be home made. Oil-base paint can be made by taking ordinary paint that has an oil base and thickening it with wood-filler, talc or powdered clay. Water-base paint can be made by mixing equal parts of cornstarch and soapflakes and coloring with tempera paint, food coloring or ink. Dissolve a half-cup of cornstarch in a little cold water, add 1½ to 2 cups of boiling water, boil and stir until thickened, cool and add a half-cup of soapflakes; then add coloring.

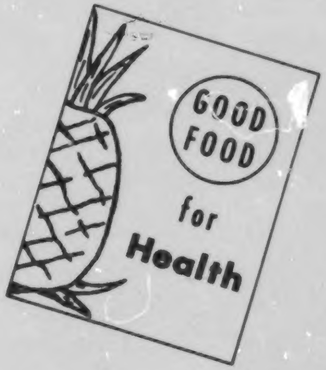
If the ink is too thin, it will run under the stencil; if too thick, it will clog the screen. The consistency should be halfway between that of heavy cream and pudding.

When using the silk-screen process, it is important to learn the compatibilities and incompatibilities of stencils, paints and solvents. The paint must not dissolve the stencil because the image will be destroyed. The stencil must have a solvent or the screen will be ruined. Two types of paint are generally used, water-base and oil-base. The chart shows combinations of stencil, paint, and solvent. There are exceptions to this general guide, but the instructions on paint can usually give detailed information.

	Waterproof Paper Stencil	**Wax and Water Soluble Glue**	**Water Soluble Stencil**	**Lacquer Soluble Stencil**
Water-base paint **Use indoors** **Solvent-water**	Good for a limited number of copies	Do not use	Do not use	Yes
Oil-base paint **Use indoors or outdoors** **Solvent-turpentine**	Yes	Yes	Yes	Yes
Solvent to adhere stencil and to remove stencil	None needed	Hot water to remove glue	Warm water	Lacquer thinner







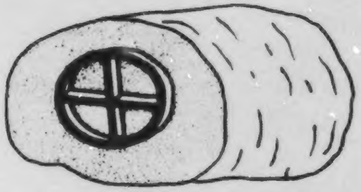
Relief Printing

Relief printing, ordinarily associated with printing presses and typesetting, is a useful process for small-scale duplication. In this case what is needed is some means of raising the surface to be printed above the surrounding surfaces. The raised image is then inked by rolling an ink-covered roller over it. Following that, the inked surface is pressed against the copy paper, or the copy paper is placed on top of the inked surface and brushed with a stiff brush or rubbed with the back of a spoon.

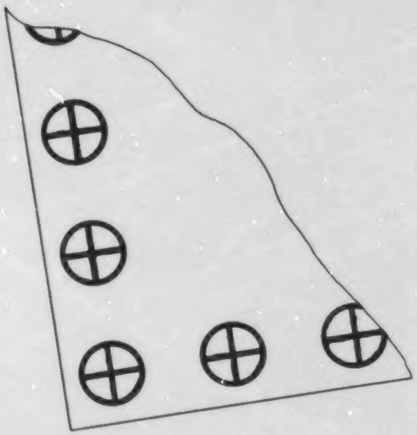
The printing surface may be made in many ways. With the traditional linoleum block or woodcut method, the background of the illustration is cut away to leave the raised original surface of the block as the printing surface. Similar results can be created by cutting the areas to be printed from cardboard or an inner tube and gluing them in place on a block of wood. The surfaces of the shapes may then be inked and printed the same as a woodcut. The roller used for inking the printing surface should have a rubber surface. A roller may be purchased for the job or may be made by fitting a wire handle to a wooden dowel covered with a piece of an inner tube.

The ink should be thick. Printing ink, mimeograph ink, or silk-screen ink will do. Roll the ink on a smooth surface, such as glass, to distribute the ink evenly on the roller. Then ink the printing surface with the roller.

One method of relief printing, called a potato print, uses fresh vegetables as the printing medium. This is a good way to make small, repetitive patterns on paper,

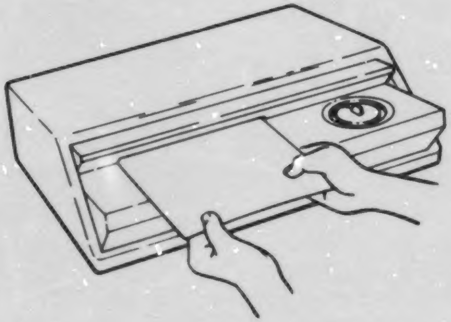


cloth or board. Depending on the size of the desired image, cut a potato, carrot, or similar item in half, and carve the negative or background image in the flat surface. With vegetables, waterbase inks work better, but for small symbols try using a stamp pad. Work rapidly in hot climates.



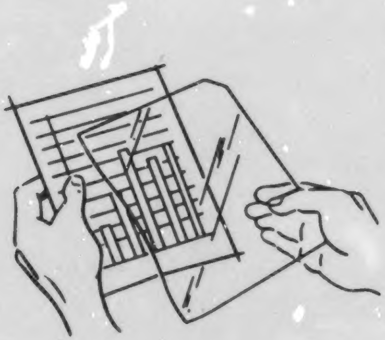
Thermal Duplication

Thermal duplication, as the name implies, is a heat process. In operation, a master copy in combination with a specially treated copy paper, passes an infrared lamp in the copy machine. Areas on the master that block the passage of infrared radiation generate heat and transfer the heat to the accompanying copy paper to produce a black or brown image.



A master to be used with the thermal duplication process must have an image that will absorb infrared radiation. Ink containing carbon particles (India ink and some writing inks), graphic pencils, and specially made ball point pens will work. Most marking pens (Magic Marker, etc.) and dye images will not work.

Thermal duplication paper will produce acceptably sharp copies of images the size of ordinary typing and larger, but will not resolve or reproduce very fine lines or accurately reproduce intermediate shapes of gray. Copies can be damaged by long exposure to sunlight or intense heat.



The thermal duplicator can produce transparencies on several types of transparent film. The film designations vary from one manufacturer to another; but, in general, they are available as black line on clear background, black line on color background, and colored line on a clear background. In addition to paper copies, the thermal duplicator can be used to produce spirit masters on special master sheets that can then be run on the spirit duplicator, which reduces the cost of multiple copies. Several manufacturers have also developed stencil duplication masters that may be cut on the thermal duplicator.

The only real limit to duplication processes is the imagination and resourcefulness of the individual. If one process won't fill the bill, try combining processes. The number of variations of duplication processes that have been developed is nearly inexhaustible. To find out if something will work, try it.

ORGANIZATIONAL PATTERNS

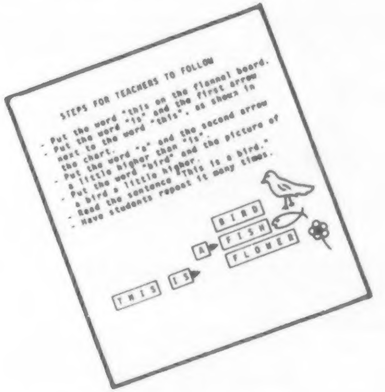
Information can be presented in one of several forms—a straightforward explanation, a story or a drama. Within each form, a writer can organize information in one of several organizational patterns. Three of these patterns will be described and illustrated.

Step by Step

The simplest is a one-two-three ordering of each step as it occurs logically. Common examples are:

- giving directions—how to find the Maternal Care Center
- explaining how to do something—how to prepare a compost heap
- describing a process—how to mount a picture.

The illustration shows the step-by-step pattern in a simple leaflet.



STEPS FOR TEACHERS TO FOLLOW

- Put the word "this on the flannel board.
- Put the word "is" and the first arrow next to the word "this", as shown in the chart.
- Put the word "a" and the second arrow a little higher than "is".
- Put the word "bird" and the picture of a bird a little higher.
- Read the sentence "This is a bird."
- Have students repeat it many times.

BIRD
FISH
FLOWER
A
IS
THIS

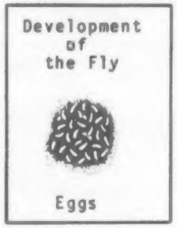
Many examples of the step-by-step occur in this manual. See Pages 63 and 64.

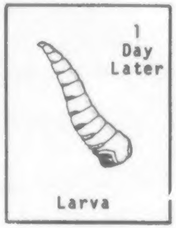
Chronological

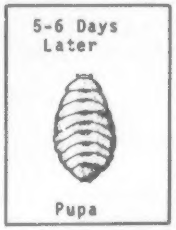
Information can be organized along a time line as each event occurs in time. Common examples are:

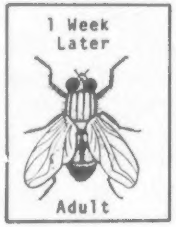
- seed planting time charts or calendars
- forms for recording inoculations
- demonstration schedules.

Reproduced are the pages of a flip chart in which the chronological pattern was used to present information.





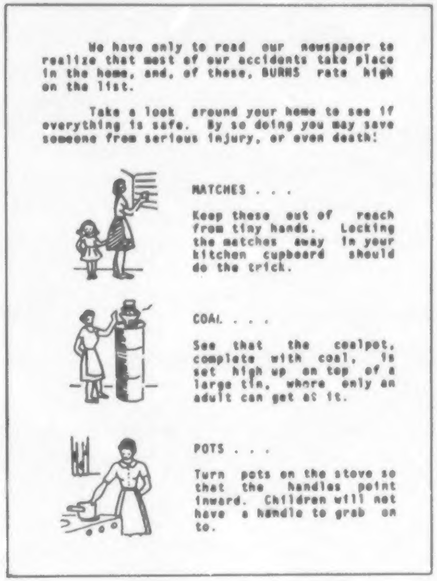




The treatment and partial script for the slide-tape, **More Yams for Hamra,** illustrates the chronological pattern in a story form. See Appendix 1.

Topical

In this organizational pattern, the writer presents information by main topics and subtopics. Information in the illustrated leaflet has been organized topically.



We have only to read our newspaper to realize that most of our accidents take place in the home, and, of these, BURNS rate high on the list.

Take a look around your home to see if everything is safe. By so doing you may save someone from serious injury, or even death!

MATCHES . . .

Keep these out of reach from tiny hands. Locking the matches away in your kitchen cupboard should do the trick.

COAL . . .

See that the coalpot, complete with coal, is set high up on top of a large tin, where only an adult can get at it.

POTS . . .

Turn pots on the stove so that the handles point inward. Children will not have a handle to grab on to.

In stories, the topics may be episodes. **More Yams for Hamra** could have been topically patterned with one episode about Ema who used Fertilizer A; the second episode about Hamra who used Fertilizer B. In this case the main topics would have been "using fertilizers"; the two sub-topics, the use of Fertilizer A and of Fertilizer B.

MORE READABLE WRITING

Writing is considered more readable when the intended audience can understand its meaning. Scholars of readability have isolated three interrelated factors (word choice, sentence length, sentence structure) which contribute to the ease of understanding.

Word Choice

A general rule to follow is "use familiar words." In some countries, writers have developed vocabulary lists based on words an audience uses in everyday talk. Such a list may number only 500 to 700 words. The list can be developed by tape recording conversations as people go about their daily work in the home, the field, or the market place. It's surprising how many things can be written with only 700 words to choose from!

When unfamiliar words are used, the reader or viewer should be helped to learn their meaning. Meaning can be taught by definition, by association, by example or through context. Concrete words can be defined rather easily by pictures—a visual definition. Words with pictures can provide meaning through association.

Abstract words and ideas may need to be defined by giving examples. These examples also can supply the context from which meaning is derived. In many cultures, "good health" may be an abstract term. Pictorial examples contrasting good with poor health could provide the context for learning what good health is. Such visuals might show a well-rounded, sturdy body in contrast to a swollen belly and spindly arms and legs; lustrous-looking skin free from sores versus wrinkled, dried, sore-infested skin; glowing, alert eyes in contrast to red, watery eyes.

Sentence Length

Long sentences are more likely to be misunderstood than shorter ones. Long sentences usually contain more ideas. The reader not only has to sort out the important ideas, but also must relate them. Breaking long sentences into shorter ones forces the writer, rather than the reader, to do the sorting and relating. Note in the leaflet, **Beware of Burns,** the shortness of most sentences. Also, look at the sentences in the narration for **More Yams for Hamra.**

Short sentences are particularly important in recorded or spoken narrations because the listener must get meaning through listening, and he may have only one opportunity to listen.

How long should sentences be? There are no set rules, only rules of thumb. For newly literate adults, an average sentence length of eight to ten words has been suggested. Average sentence length means just that—an average based on the total number of words in a passage divided by the total number of sentences in the passage. This paragraph, for example, has an average sentence length of about 15 words.

Not all short sentences are easy to understand, but this is generally so.

Sentence Structure

Variety in sentence structure tends to make writing more interesting. A question can recapture the reader's or viewer's wandering attention. Emphasize an important point by asking a question about it. An exclamation is an emphatic. Use it to punctuate an important point. An imperative directs attention. That's what imperatives are—directives! In visual-verbal media, try sentence fragments. Let the picture identify the object visually, the word name it. After reading this paragraph, note the sentences —short in length, varied in structure.

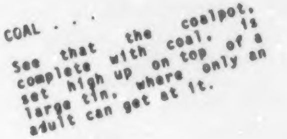
More personalized writing tends to make it more interesting. Either real or simulated conversation or dialog gives a personalized touch. Note in the narration of **More Yams for Hamra** the simulated conversation and dialog. If, in taping the narration, more than one voice could be used, real rather than simulated dialog would result. The personalizing quality of dialog is one reason why drama so involves an audience. As previously mentioned, the puppet show is a most effective medium for simple dramatizations.

Complicated structure tends to make sentences more difficult to understand. The structure acts as a mask to meaning. The mask may be in the form of parenthetical expressions, subordinating clauses, or excessive amounts of descriptive phrases and clauses.

Often, sentence structures can be simplified by taking out unnecessary words, or deleting unimportant parenthetical expressions. If important, they should be put into separate sentences. For example: **Farmers, particularly those tilling poor soils, can increase crop yields by using fertilizers.**

To simplify, re-write as two sentences: **Farmers can increase crop yields by using fertilizers. For farmers tilling poor soils, fertilizing is a must.**

In the leaflet example, **Beware of Burns,** the sentence about COAL has a complicated structure. Such a sentence should be tested by having someone representative of the audience read it for meaning, particularly for a spoken narration.



COAL . . .

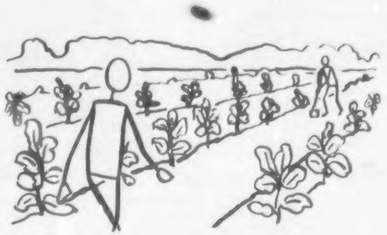
See that the coalpot,
complete with coal, is
set high up on top of a
large tin, where only an
adult can get at it.

Written materials should be interesting to read or to listen to as well as readable or listenable. The writer's task is to strive for balance between simplicity and interest.

SOME RULES WHEN WRITING FOR VISUAL-VERBAL MEDIA

The following are a few rules of thumb when writing for visual-verbal media. First, let the picture tell as much of the story as it can. Use words to interpret the picture, not describe it. Note Scene 13, Page 86, in **More Yams For Hamra.** The visual shows Ema with fertilizer in his hand and offering it to Hamra. The narration does not describe what the picture shows. Rather it suggests what Ema wants Hamra to do, and it provides a verbal link to the Close Shot in Scene 14.

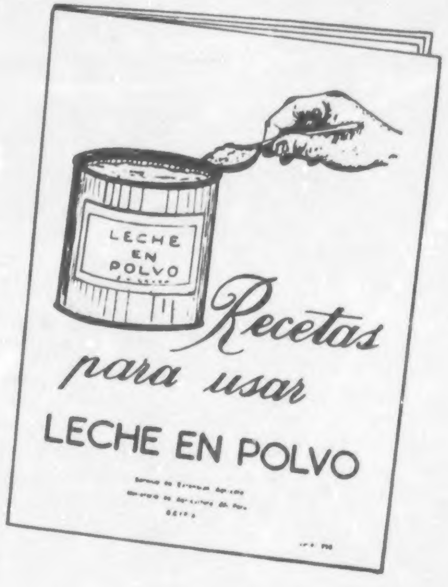
The second rule is a don't. Don't tell about something not shown in the picture. Don't say of Hamra in Scene 2 that he is the father of many children. There is nothing in the scene to indicate he is a parent, let alone the father of many children. If the fact that he has many children is important to the story, change the visual. Show Hamra at his home with many children around him as he is preparing to leave for the village. The idea of many children can be understood from this visual. If it is important to the story to know the exact number of children he has, let the narration for the scene state the number.



The third rule is another don't. Don't write too much for each picture regardless of whether it is a spoken or printed narration. How much is too much? For spoken narrations, a maximum limit of 15 to 20 seconds per visual, and no more than three successive visuals with this maximum. For a printed caption, the maximum is four lines. By varying narration length from visual to visual, the writer varies the pace of the presentation.

Use of shorter sentences for spoken information is the fourth rule. This rule is particularly important for continuous running narrations, such as the sound track of a motion picture or televised presentation, for radio programs or tape recordings, or visual presentations with recorded narrations.

Finally, and most importantly, write for the intended audience, not for literary critics. Use an organizational pattern the audience can follow. Structure sentences and select words for audience understanding. Keep rules in mind, but break them when they interfere with understanding. Writing is the means for talking to people to bring information, to develop skills, or to change or modify attitudes.



APPENDIX 1

AN EXAMPLE OF THE FOUR STEPS IN PLANNING

This Appendix includes example materials to illustrate the four planning steps described in the section, Planning Instructional Materials.

- **Step 1 — Statement of Objectives**
  Knowledge-need objective: Following a group presentation showing two types of fertilizers and their uses, farmers should be able to distinguish between them and be able to explain when and how both fertilizers should be used.

- **Step 2 — Presentation Strategy**
  A slide-tape presentation was selected for the following reasons:
  1. Generally, slide-tapes are a good strategy for group presentations.
  2. With people in this village, prior experience has shown projected media to be effective attention-getters and attention-holders.
  3. Facilities and resources are available to make and show slide-tapes.
  4. Prior experience has shown villagers willing to be photographed and assume character roles in similar presentations. Thus, good opportunity to involve them.
  5. Narrated tape to accompany slides provides verbal information for those who can't read.

- **Step 3 — Selection of Information**
  The objective calls for information about two types of fertilizers, their distinguishing characteristics, and when and how each is used. This information needs to be included in the slide-tape.

- **Step 4 — Organization of Information**
  In the sample content outline, treatment, and storyboard-script that follow, the two types of fertilizers purposefully have been identified only as Fertilizer A and Fertilizer B.

Content Outline

I. Fertilizer A—Characteristics
  A. Color—gray
  B. Powdery with small lumps
II. Fertilizer B—Characteristics
  A. Color—white
  B. Grainy like coarse sugar
III. Using Fertilizer A
  A. Before planting
    1. Spread between old rows
    2. Spread evenly
  B. Advantages
    1. Easiest to apply
    2. New rows directly over fertilizer
  C. After planting
    1. Apply immediately after plants break soil
    2. Apply around young plants

IV. Using Fertilizer B
  A. Application of three-week-old plants
    1. Place around plants close to roots
    2. Cover fertilizer with soil
  B. Application of six- to eight-week-old plants
    1. Place around plants close to roots
    2. Cover fertilizer with soil
V. Cautions: Fertilizer A and B
  A. Always cover fertilizer
  B. Weed regularly for full fertilizer benefits to crops

Treatment

Prior experience has shown these villagers traditionally have been taught about village life, tilling the soil, etc. through stories. They also use the story form to teach their children. Because of this, the information in the Content Outline has been "treated" in story form.

Opening slides show Hamra walking along a dusty road and stopping to look at the fine crop of three-week-old yams his friend Ema is growing. Hamra inspects a few of the plants as he muses: What is my friend, Ema, doing to get such fine yam plants? He notices the field is free of weeds and muses once again: There are no weeds in his field. That must be what makes his yam plants so fine. If I keep the weeds from my field, perhaps I can grow fine yams, too.

In the distance we see Ema hoeing his field. Hamra notes: There is Ema working in his field now. I will stop to ask him about his fine crop.

We next see Ema greeting Hamra, followed by closer shots of the two men talking together and finally walking across the field toward Ema's house. A narrator explains that Ema is telling Hamra that his yam plants are so fine because he has put fertilizer on his field and offers to show Hamra what fertilizer is if Hamra will come to his house now to see the fertilizer.

We then see Ema and Hamra at Ema's house where he shows Hamra a bag of Fertilizer A. He also shows Hamra a leaflet which explains how to use the fertilizer.

The leaflet illustrations now become the visuals in the slides to show how to apply Fertilizer A. The narration is Ema's explanation of each of the illustrations to Hamra. But, says Ema, It is too late for you to use Fertilizer A because it must be put on your land before a crop is planted. Hamra is seen shaking his head in sadness at this information. Then Ema tells him that there is another kind of fertilizer he can use because it is the kind that is put on when plants are three weeks old. But Hamra shouldn't delay. The other fertilizer is called Fertilizer B, and the agriculture office in the village will have some. Hamra asks Ema to go to the village with him to see the agricultural officer.

The next series of slides shows Hamra with Ema and the agricultural extension officer. As the officer tells and shows Hamra how to use Fertilizer B, we see illustrations in a leaflet which show the steps and the cautions of covering the fertilizer so it does not wash away and of ridding the field of weeds. At the end of the explanation, we see Hamra and Ema leaving the agricultural officer, each carrying a bag of Fertilizer B.

The next series of slides shows Hamra with Ema at Hamra's field. Ema helps him apply Fertilizer B to the three-week-old yam plants. Ema then takes Hamra's hoe and tells him he must get rid of the weeds in his field because the fertilizer makes weeds grow just as well as it makes yam plants grow. Ema also reminds Hamra that he must put fertilizer on his plants again in three to four weeks, in the same way they have just done. After Ema leaves, Hamra goes to work on the weeds with his hoe.

The narrator makes a time transition to four weeks later. We see Hamra admiring his strong seven-week-old plants and putting the second application of Fertilizer B on his field. As the steps of the second application are shown, the narrator reviews the steps. The narrator also cautions again about the importance of ridding the crop of weeds.

The final sequence of slides shows Ema's and Hamra's yield of yams and Hamra's expression of gratitude to Ema for telling him about fertilizers. Hamra also tells Ema he will remember that Fertilizer A can be put on the land before yams are planted and that he intends to use it before planting the next crop. The last slide shows the families of Hamra and Ema joining in a celebration of a good harvest.

Storyboard-Script

Only selected sequences of the treatment are reproduced as a sample storyboard-script. Omissions are indicated in the Slide Description column.

SLIDE DESCRIPTION

1. Title Frame: More Yams for Hamra

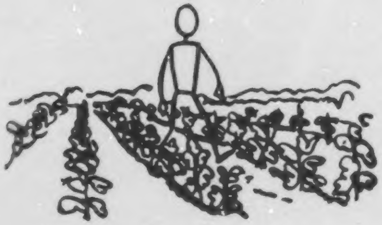
More Yams

for

Hamra

TAPED NARRATION

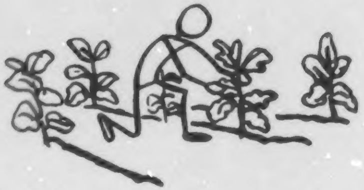
2. Medium shot. HAMRA on path walking toward camera. On both sides are healthy, good-sized yam plants.



One day, on his way to the village, Hamra took the path through Ema's field of yams. How big Ema's plants are! he thought.

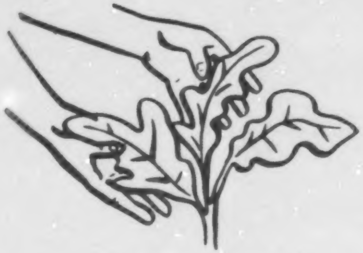
Production Note: Narration should be spoken by one who is adept at story telling. The village story teller might be the ideal.

3. Medium close shot. HAMRA bending down inspecting yam plants.



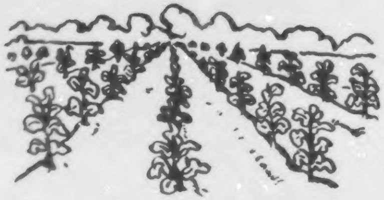
Bigger than mine. And we planted them the same day.

4. Close shot of yam plant. HAMRA's hands can be seen touching the leaves. **Production Note:** Hands in the scene will provide visual cue to leaf size relative to man's hands.



I wonder what he is doing to get them to grow so big and have such healthy looking leaves.

5. Medium shot down a row of yams. No weeds in rows.



There are no weeds in his field. That must be what makes his yam plants so fine.

6. Full shot of field. In background EMA is seen hoeing. HAMRA in foreground looking toward EMA.

Omitted scenes 7, 8, 9, 10.

11. Full shot of Hamra and EMA with EMA's house in background. HAMRA and EMA walking along a path through the field toward the house.

    Production Note: Since in this slide, the men's backs will be toward the audience, it will be important for them to have different figured or colored clothing (if the slides are in color).

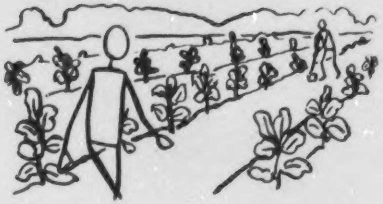
12. Medium shot of the opened door of EMA's house. EMA is shown inviting HAMRA to enter.

    Production Note: Local customs should be investigated to find out where fertilizer likely would be stored. Also local customs related to a fellow farmer's making a business trip to a home. Additional slides might be necessary to allow for these customs.

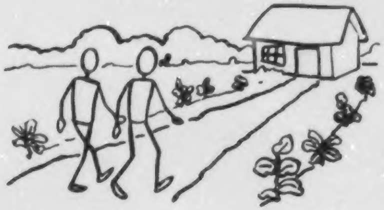
13. Medium shot of EMA and HAMRA inside EMA's house. They are squatted down beside opened sack of Fertilizer A. EMA holds out handful of fertilizer to HAMRA.

    Production Note: In a pre-trial of the slides with several farmers in the village, the visual jump between Slides 12 and 13 should be checked for audience understanding.

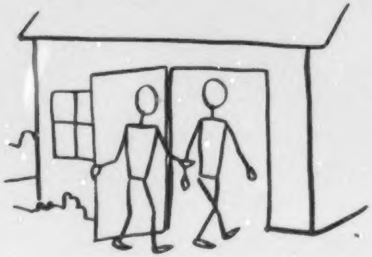
AN EXAMPLE OF THE FOUR STEPS IN PLANNING



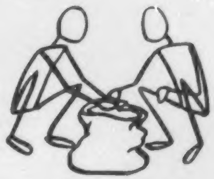
As Hamra looked across the field, he saw Ema. There's Ema now, he said to himself. I will stop to talk with him about his fine crop.



On the way to Ema's, Hamra asked many questions. Ema patiently answered, but would always say: I will show you. I will show you.

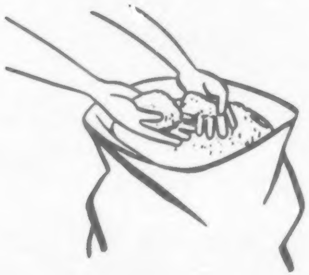


Here we are, Hamra. Now, you will see the fertilizer and how I used it.



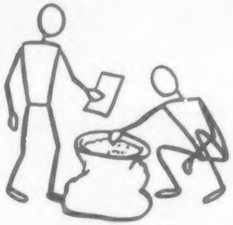
Take some in your hands, Hamra.

14. Close shot from above the fertilizer sack to show HAMRA's hands inside the open sack, fertilizer in them as if he has just scooped up a double handful. **Production Note:** Shot should be close enough so the powdery with small lumps quality of the fertilizer is shown. Pre-trial of this slide with sample audience might be needed to insure the largeness of the hands in close shot would not be misinterpreted by the audience.



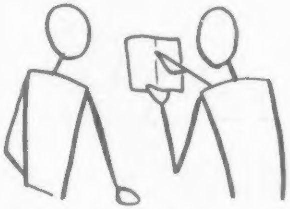
See its gray color and how powdery and lumpy it is. You can crush the lumps easily with your hands—just like the soft lumps in good soil.

15. Medium shot of HAMRA and EMA. Ema is now standing in back of HAMRA who is still squatting beside the Fertilizer A sack, the fertilizer still in his hands. He is looking toward EMA. EMA has a leaflet in his hand.



Now, let me explain how to use the fertilizer. See this leaflet.

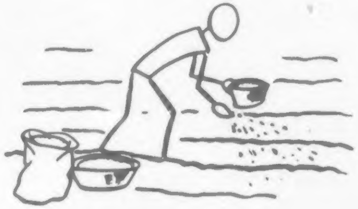
16. Medium close shot over the shoulder of EMA and HAMRA, both standing. Both are looking at the leaflet.



It shows you what you must do.

17. Close shot of first illustration in the leaflet.

Production Note: The leaflet illustrations used for the next four slides could be those in the leaflet which has been distributed during the question-answer period following the visit to the experimental plots. See the check list on Page 4.



This picture shows how you spread Fertilizer A between the rows on your land before you prepare it for the next planting. See how easy it is!

APPENDIX 2

EVALUATION PROCEDURES

The purpose of this Appendix is to show some simple techniques you can employ to analyze an audience, test message materials, and evaluate the results of communication efforts.

These will be explained under three headings: questionnaires, sampling techniques, and interview procedures.

Questionnaires

The simplest kinds of questions you can ask are those to which favor-oppose, can-cannot, yes-no type answers can be given. Fortunately, almost any problem can be broken down into such binary-type alternatives. As you ask questions, keep a record of the audience responses.

The following are some examples of binary-type alternatives:

Did you attend the farm fair? yes ...... no ......
Do you favor or oppose another farm fair this year? favor ...... oppose ......
Who is your local agricultural officer? knows ...... doesn't ......
Did you listen to last week's farm radio program? did ...... didn't ......
Do you alternate a cover crop with your maize? does ...... doesn't ......
Do you think you could sell more maize if you could grow it? could ...... couldn't ......
Did you have an opportunity to meet your agriculture officer? yes ...... no ......
Do you remember his name? yes ...... no ......

Some people like one color better than another for certain things. What color would you consider appropriate for a fertilizer sack — flour sack — family planning poster etc.?

red? yes ...... no ......
blue? yes ...... no ......
green? yes ...... no ......
black? yes ...... no ......
other? yes ...... no ......

After showing a filmstrip which treats the proper method of lifting ground nuts, ask the test subject to show you how it is done.

Does he break soil properly? yes ...... no ......
Lift roots properly? yes ...... no ......
Shake loose dirt carefully? yes ...... no ......

What exhibits were of interest to you at this year's farm fair?

groundnut lifting demonstration? yes ...... no ......
fertilizer demonstration? yes ...... no ......
sheep shearing demonstration? yes ...... no ......
home canning? yes ...... no ......
Do you plan to use type X fertilizer this year? yes ...... no ......
If yes, where will you obtain it? knows ...... doesn't ......

Another type of questionnaire is a checklist of questions that should be asked when producing materials. The following example lists ten major questions with some subpoints that relate to the production of a leaflet or booklet.

☐ What is the objective?

- Stated specifically
- Stated in measurable terms
- Related to reader wants and needs

☐ Who is the reader?

- Age
- Sex
- Education
- Cultural background
- Social status

☐ What does the reader think?

- Knowledge of subject
- Attitudes toward subject
- Attitudes toward change

☐ Are the facts adequate?

- Accurate
- Complete
- Conflict with program or with audience
- References

☐ Will the reader understand?

Readability
Illustrations

☐ Are the ideas presented workable?

Physically possible
Resources available
Culturally acceptable

☐ How will the material be reproduced?

Methods available
Costs
Quantity
Quality

☐ How will the leaflet or booklet look?

First impression
Interesting layout

☐ How will the material be distributed?

Size
Cost
Publicity or advertisement
Sub-distributors

☐ Will the reader react as planned?

Understand
Accept
Act

Sampling Techniques

To obtain a perfect picture of your audience with respect to any yes-no item of information, you would have to record accurate data for every member in it. Alternately, should you interview only two or three individuals, the certainty of obtaining answers which portray the larger group accurately will be extremely low. Two factors bear on the confidence you can place in findings from any sample: (1) representativeness, and (2) size.

Any sample is representative only to the extent that every person in the population from which it is drawn has an equal opportunity of being included in it. The following are methods used to attempt to obtain representative or random samples.

Systematic sampling. If it is possible to find prepared lists of the names of members of the population which you wish to investigate, you can simply divide the total number of names by the number required in your sample and draw every *n*th number. For example, if there are 5,000 names on a list and you want a sample of 100, you simply take every 50th name.

This method is fraught with possibilities for error, however. Printed lists may not be representative of the population you wish to investigate for various reasons. Telephone books may include only the wealthy; church attendance lists may contain only the more socially active; school lists contain only those with school-age children, etc.

Simple randomization. From a complete list of all names of individuals in a village, of all numbered houses or squares in a village, of all villages in a province, of all attendants at a farm fair, etc., you can obtain a random sample by (1) numbering **all** entries, (2) placing all numbers in a box, (3) shaking the box thoroughly and (4) drawing numbers. After each number is recorded, it must be replaced and the box re-shaken before drawing again. If you can obtain a table of random numbers, this process can be simplified.

Stratified random sampling. Sometimes it is desirable to break large populations into sub-groups, each of which has particular characteristics, and then randomize proportionate samples from each of the sub-groups. For example, you may wish to be certain that your sample includes high and low income groups, urban and rural families, different religious faiths, etc., in proportion to their numbers in the total population. To obtain a stratified random sample, you will use separate boxes for each group and draw numbers from each box in proportion to the group's percentage of the total.

Though different sub-groups differ in their responses to the questions you ask, your combined sample may better represent the total population than would a random drawing from all members at large.

Assuming a representative sample of the audience has been questioned, the size of the sample selected will determine the level of confidence that you can have in the findings. Statistical techniques can be used to determine appropriate sample sizes. However, in most situations a small sample will provide the information necessary to improve the effectiveness of your instructional materials.

Interviewing Procedures

It is not always easy to obtain valid responses to your questions. Sometimes questions are misunderstood. Sometimes, in order to be polite, respondents will give answers they think the interviewer may prefer to hear. Sometimes they may avoid being asked questions when alone, and when accompanied by a friend may tend to report what they think their friend would prefer to hear. Sometimes they may not trust the interviewer, or may question his motives and attempt to trick him. The following practices may help to alleviate some of these difficulties.

- Select your interviewers from among the groups to be questioned. Farmers respond best to farmers, women to women, church folk to church folk, etc.
- Word your interview questionnaire in the vernacular of your audience. Foreign words or alien modes of expression may be offensive or misunderstood. When interviewers have a share in phrasing the questions, they may tend to enter more wholeheartedly and sympathetically into their tasks.
- Carefully train your interviewers to (a) identify the agency sponsoring the study, (b) explain the purpose of the questioning, (c) tell why and how their respondents were selected, and (d) assure their respondents that their answers will be kept confidential.

APPENDIX 3
COMMUNICATION FACTORS IN FAMILY PLANNING

The following tables are a simplified, adapted version of a mimeographed publication by Dr. Gerald Winfield that gives detailed suggestions on specific uses of media in a national family planning program. Although this is not a complete tabulation of all media possibilities (flannel boards, for example, are not mentioned), there are many worthwhile suggestions for the use of a variety of materials for several different kinds of audiences. A study of the ideas suggested here for use in communicating family planning information can be adapted by the Peace Corps volunteer for communicating information relating to family planning, health, agriculture production and distribution, or community development. The tables are divided into major areas where media might be used as follows:

- Mass media
- Home visits
- Small group instruction
- Large group instruction
- Family planning center, health center, hospitals

It should also be remembered that a correlation between such communication efforts and what is being taught in schools can help to increase communication effectiveness.

Mass Media

MEDIA	CHARACTERISTICS	LIMITATIONS	SUGGESTED USE
Postal System	Distribution of printed materials by mail can be an effective and economic means of reaching potential family planning users	Most effective when large percent of audience is literate . . . however, illiterate will probably find ways of having mail read to him	Should be tried experimentally for various kinds of family planning information
Press	Important medium for reaching leaders and a widening segment of the population . . . good for building public support	Most effective with literates . . . not suitable for discussion of specific birth control methods	All family planning programs should have continuing publicity through the press . . . this can be carried out by volunteers, by professional newsmen, or by government information officers
Periodicals	Good for in-depth studies of of family planning problems . . . periodicals reach many specialized audiences	Sometimes difficult to get articles into print . . . audiences are limited	Should study periodicals to determine who can be reached with what kind of messages . . . There should be a long-term program to get family planning information into periodicals
Commercial Films	Millions of people attend movie theatres . . . news reels and short subjects can carry family planning information	Subject matter must conform to accepted tastes and standards . . . expensive to produce unless done by government film units	A study should be made of commercial film situations to seek possibilities of using newsreels or short subjects
Educational Films	16-mm films can be produced and shown widely . . . mobile units reach many rural areas . . . films can show family planning information in dramatic form	Require specialized skills and equipment to produce and show	Should keep film in mind as an effective medium to promote family planning programs

Mass Media

MEDIA	CHARACTERISTICS	LIMITATIONS	SUGGESTED USE
Radio	Can be programmed in a variety of forms such as news and dramatic shows . . . reaches people almost everywhere . . . serves to inform and develop support for family planning	Probably limited to awareness and early adoption stage	Should have high priority in any program
Television	Reaches an increasingly large segment of population, especially leaders	Expensive and require large organizational support	Will become an increasingly important communication medium and should have continuing attention

Home Visits

MEDIA	CHARACTERISTICS	LIMITATIONS	SUGGESTED USE
Flip books	10 x 12 book good with 5 to 10 people . . . useful to the home visitor in presenting general family planning information and specific methods	Production requires skill and effort . . . difficult to carry and protect from weather	Suitable flip books covering a number of subjects should be provided to home visitors . . . then serve to motivate and to guide the visitor on points to cover
Flash cards	Useful with 2 to 3 people for presentations . . . small, easy to carry	Easy to get out of sequence . . . cannot carry as much information as flip books	Useful when made by a person to meet specific needs
Demonstrations	Very effective teaching media	Large demonstration devices cannot be easily moved for home visits	Home visitors should be equipped with a set of appropriate family planning devices and trained in how to show and explain them
Pamphlets	Serve as a reminder of the why and how of family planning . . . well-designed sequenced picture stories can be understood by illiterates	Vocabulary must be matched to audience . . . can be costly if not carefully designed and fully pre-tested	Home visitors should distribute pamphlets designed to match the stages of adoption

Small Group Instruction

MEDIA	CHARACTERISTICS	LIMITATIONS	SUGGESTED USE
Flip books	Large flip books (20 x 30 inches) are effective presentation devices with groups up to 50 people . . . serve as a guide and support to the instructor	Expensive to produce . . . must be protected from moisture and rough handling	Can be used effectively in place of projected materials . . . instructors should have flip books available and be trained in their use
Flash cards	Large flash cards are similar to flip books but the order can be changed	More difficult to handle than a flip book and the order can be confused easily	Useful to meet specific needs
Slide sets	Attract attention and teach extremely effectively . . . can be sequenced to meet specific objectives	Projectors require electric power (some battery models are satisfactory with small groups) . . . require darkened room or night showing . . . sequence can easily be mixed up . . . require careful design and production	Recommended for training technical personnel and family planning personnel, useful with the public when power is available
Filmstrips	Similar to slides except sequence is fixed	Require equipment power and darkening . . . require careful design and special production techniques	National family planning should develop the capability of designing filmstrips and a plan to utilize them effectively
Models	Useful to teach sex anatomy and the birth process	Costly and difficult to transport	Use in the instructional programs at family planning centers and with the public as opportunities arise
Pamphlets and Demonstrations	Can be used with small groups the same as with home visits		

Large Group Instruction

MEDIA	CHARACTERISTICS	LIMITATIONS	SUGGESTED USE
Lectures	Can play a useful role in generating public support and understanding of a family planning program	Not generally useful for presenting specifics of birth control	Family planning should make use of lectures covering population problem, economics of family planning, public policy, etc.
Illustrated Lectures	Good for transmitting technical information to specialized audiences	What is illustrated and how it is illustrated must be carefully considered	Should be developed for specialized audiences as part of any overall program
Panel Discussions	Good with conference groups to promote audience and community participation	Require skilled discussion leaders	Use when suited to a specific purpose
Filmstrips	Excellent with large groups . . . when synchronized with tape recording can be staged by personnel who could not duplicate as a live performance	Require equipment, darkening and power . . . as well as careful design and production . . . expensive to produce, but can be duplicated in quantity at low cost	Large family planning programs should consider filmstrips for telling their story and explaining the importance of family planning to large audiences
Films	16-mm films are extremely effective with large audiences . . . attract attention in almost all situations . . . some films are available	Expensive to produce and require specialized skills and equipment to produce and show—(mobile units are often available from departments of extension, health or information)	Should be kept in mind for use as budget permits

Family Planning Centers, Health Centers, Hospitals

MEDIA	CHARACTERISTICS	LIMITATIONS	SUGGESTED USE
Instruction using real things and bodies	Personal, individual and, when properly done, highly effective	People must be motivated to come to the centers	Should be an important part of the entire family planning effort
Pictures and charts	Good pictures and charts can clarify many things that cannot be easily shown with real things and bodies	Visuals must be simple as many clients cannot understand complicated techniques such as cross-sectional drawings or exploded views	Should be used in every family planning center to help teach specific objectives
Models	Range from simple anatomical models that show significant organs and their relationships to elaborate models that show all major events of a menstrual cycle . . . more easily understood by people than two-dimensional materials	Expensive and need careful maintenance to keep in good condition	Useful supplementary materials when budget permits
Pamphlets	Effective as take home pieces to remind clients why and how to practice family planning	Illiteracy is the biggest barrier to the use of pamphlets . . . this can be overcome to a large extent by using picture-dominated materials	Family planning centers should have several pamphlets designed to match the stages of adoption

APPENDIX 4
FORMULAS

Hectograph Formulas

Printing Surface Formulas—Ingredients

1 part fish or animal glue
2 parts water
4 parts glycerin

Preparation

1. Break the glue into small pieces and put them into a can with the water to soak for two hours.
2. Place the can of water in a pan with boiling water (the double boiler principle) to prevent burning. Continue to boil the water and stir the glue constantly until it is totally dissolved.
3. Add the glycerin and continue to heat for 15 minutes, stirring occasionally. Adding an ounce of sugar for each quarter pound of the mixture will give a better consistency.
4. Pour the mixture into a flat, shallow pan made of metal or wood. Straining through a loose-weave cloth will eliminate any dirt particles. After a few hours the printing surface will be ready to use.

Other satisfactory combinations are:

glue, 12 grams
gelatin, 2 grams
water, 7½ grams
sugar, 2 grams
or
gelatin, 10 grams
sugar, 40 grams
glycerin, 120 grams
barium sulfate, 8 grams

Ink Formulas

alcohol, 22 cc
water, 14 cc
indigo blue, 2 grams
saffron, methyl green, and other colored dyes may also be used.

Making Chalk

If chalk is difficult to find, you may be able to make your own when the right type of soil is handy. You probably won't be able to find it in a pure form, but chalk may be an ingredient of any white to buff colored soil including rocks that are easily crumbled. This is how James Cole, an educational advisor in Haiti, describes the process:

1. Shovel up some likely-looking soil into a bucket or other container, leaving room for about four times as much water as soil.
2. Pour in the water and stir vigorously. Crumble large pieces and dissolve as much soil as possible but do not try to pulverize hard rocks.
3. Allow the soil to settle overnight.
4. Pour the water off the top and skim off the top layer of silt. This is usually several inches thick, and is "chalk" in a liquid state.
5. Put it in a bag made of muslin or similar cloth and let it drip overnight. To speed this process, the water may be squeezed out.
6. Roll the chalk, which now resembles clay or bread dough, into long, snake-like pieces, cut to desired lengths, and let dry.

If your soil is the right kind, you have chalk. Test it. If it does not write well, seek other soil samples, but don't overlook the possibility that you may have discovered something which has other uses.

Making Dyes and Paints

The materials for making many different colored dyes are available in local markets. Laundry bluing is one readily available material.

A wide variety of roots, bark, seeds, and leaves can be used to make dyes and paints. In general, the procedure for making dyes is to boil the vegetable matter in water until the desired color is obtained. Check with the local dyers and chemists to learn what color dyes can be produced from local materials.

Paint similar to poster colors can easily be made from commercial or homemade dyes. Mix the dye with a thin glue solution and powdered clay to give it body. Ground charcoal can be used in place of the dye to make various shades of gray paint.
Blackboard paint can be made with:

1 part lamp black
1 part varnish
1½ parts of kerosene

Mix thoroughly before using to disperse the lamp black.

Making Rubber Cement

Start with five grams of raw sheet rubber and 250 cc (about a pint) of uncolored gasoline. Use the translucent brown sheet rubber, if available. Put the rubber and gasoline in a jar with a screw top. Let it stand for a few days. Stir thoroughly and the adhesive is ready to use.

If the cement is a bit thin, add more rubber; if too thick, add more gasoline. If uncolored gasoline is not available, filter colored gasoline through a charcoal filter several times to remove the color.

Whether you buy rubber cement or make your own, it should be stored in a brown jar with a tight fitting lid or some reasonable equivalent because light and air can cause it to spoil.

Model Making Materials

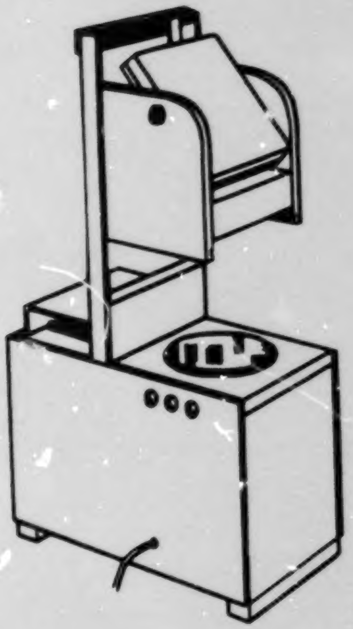
Many materials will work well. What to use depends on availability and personal preference. Following are several possible modeling materials.

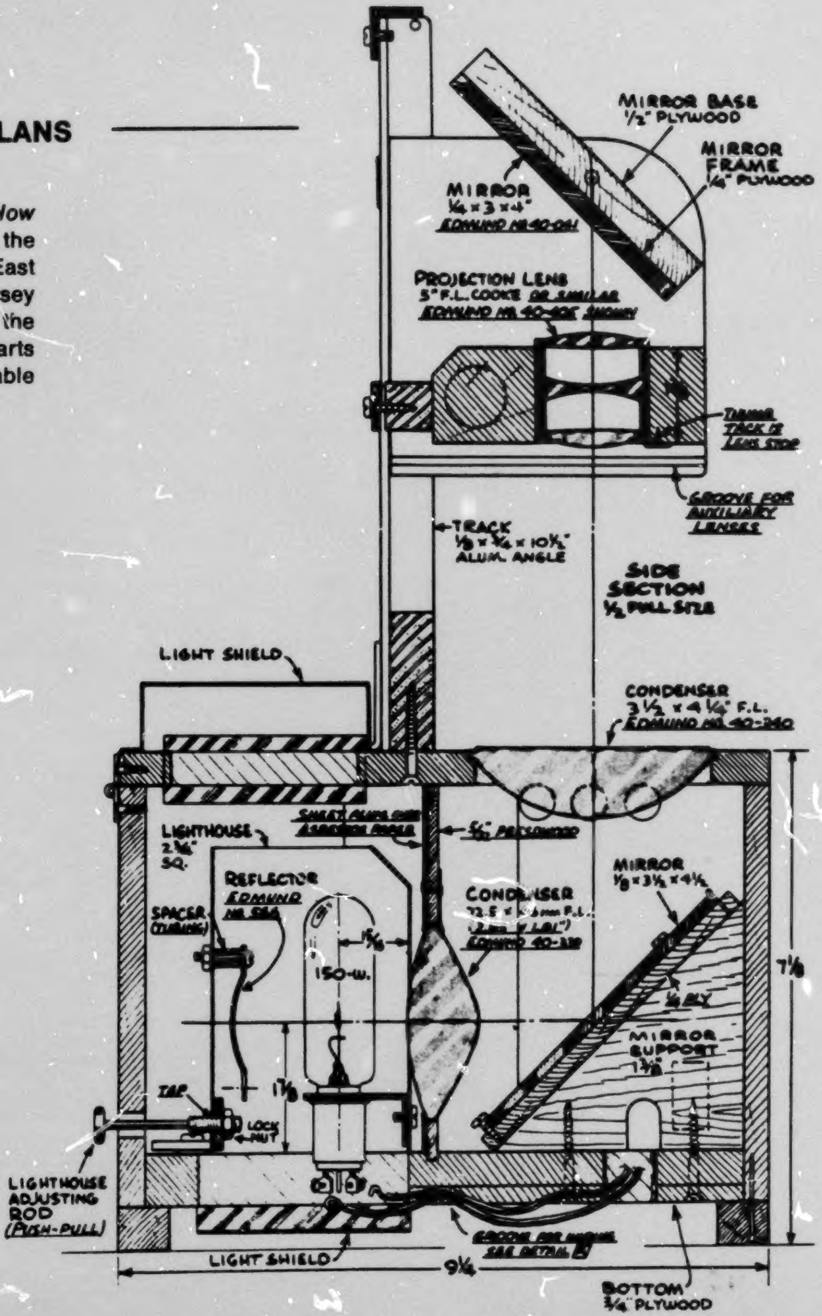
- Mix equal quantities of flour and salt. Add water and continue mixing until a ball of dough forms. Liquid or powdered colors can be added when mixing.
- Shred newspapers or paper towels. Mix with any starch paste and knead thoroughly.
- Dissolve a half pint of starch paste in water to thin slightly; add three quarters of a pint of plaster; add one pint of sawdust; knead to consistency of tough dough.
- Soak small pieces of newspaper in water overnight; rub wet paper between palms of hands until it is ground to a pulp; mix a quarter teaspoon of glue in half a pint of water; add one pint of plaster; two pints of wet paper pulp, and knead to a doughy consistency.
- Mix a half pint of dry clay powdered and sifted through a screen with one teaspoon of glue in a cup of water; add wet paper pulp and knead to a doughy consistency, adding more water as needed.
- Powder mud from an ant hill and mix with water.

APPENDIX 5

EQUIPMENT CONSTRUCTION PLANS

These plans are from the 50¢ booklet, *How To Build Slide Projectors*, published by the Edmund Scientific Company, 101 East Gloucester Pike, Barrington, New Jersey 08007. Many other plans are included in the booklet. Lenses, reflectors and other parts for building projectors are also available from the Edmund Scientific Company.




MIRROR BASE
1/2" PLYWOOD
MIRROR FRAME
1/4" PLYWOOD
MIRROR
1/4 × 3 × 4"
EDMUND NO 40-041
PROJECTION LENS
5" F.L. COOKE OR SIMILAR
EDMUND NO 40-405 SHOWN
THUMB TACK IS LENS STOP
GROOVE FOR AUXILIARY LENSES
TRACK
1/8 × 3/4 × 10 1/2"
ALUM. ANGLE
SIDE SECTION
1/2 FULL SIZE
LIGHT SHIELD
CONDENSER
3 1/2 × 4 1/4" F.L.
EDMUND NO 40-240
LIGHTHOUSE
2 3/4"
SQ.
5/32" PRESSWOOD
REFLECTOR
EDMUND NO 566
SPACER (TUBING)
CONDENSER
EDMUND 40-332
150-W.
1 5/16
1 7/8
MIRROR
1/8 × 3 1/2 × 4 1/2
1/4 PLY
MIRROR SUPPORT
1 3/8
7 1/8
TAP
LOCK NUT
LIGHTHOUSE ADJUSTING ROD (PUSH-PULL)
LIGHT SHIELD
9 1/4
GROOVE FOR WIRING
BOTTOM
3/4" PLYWOOD

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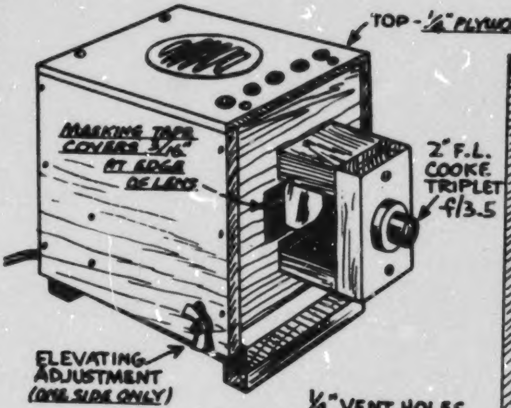
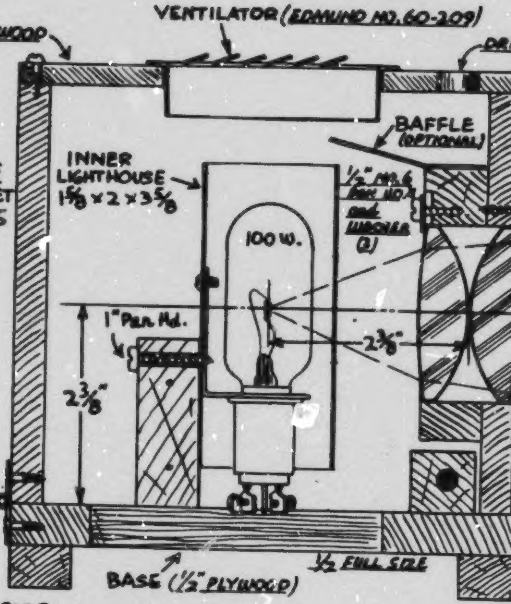
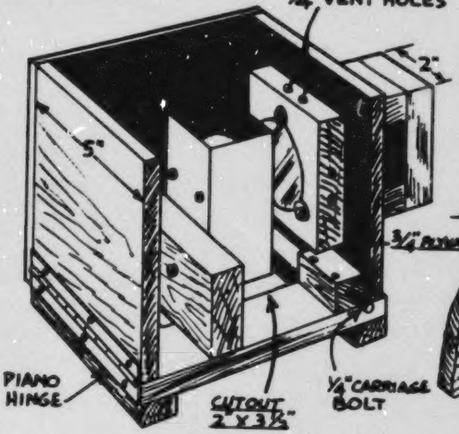
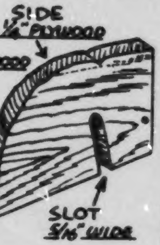
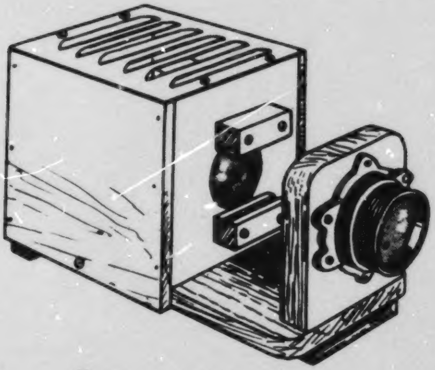
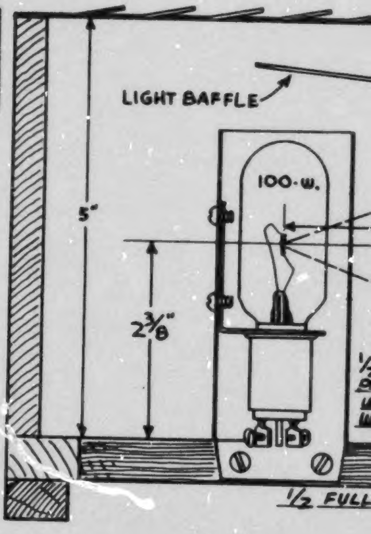

TOP - 1/4" PLYWOOD
MASKING TAPE COVERS 3/16" AT EDGE OF LENS
2" F.L. COOKE TRIPLET f/3.5
ELEVATING ADJUSTMENT (ONE SIDE ONLY)


VENTILATOR (EDMUND NO. 60-209)
DR
BAFFLE (OPTIONAL)
INNER LIGHTHOUSE 1 5/8 × 2 × 3 5/8
1/2" NO. 6 PAN HD. and WASHER (2)
100 W.
1" Pan Hd.
2 3/8"
2 3/8"
BASE (1/2" PLYWOOD)
1/2 FULL SIZE


1/4" VENT HOLES
2"
5"
3/4" PLYWOOD
PIANO HINGE
CUTOUT 2" × 3 1/2"
1/4" CARRIAGE BOLT


SIDE 1/4" PLYWOOD
SLOT 5/16" WIDE




LIGHT BAFFLE
100-W.
5"
2 3/8"
1/2 FULL

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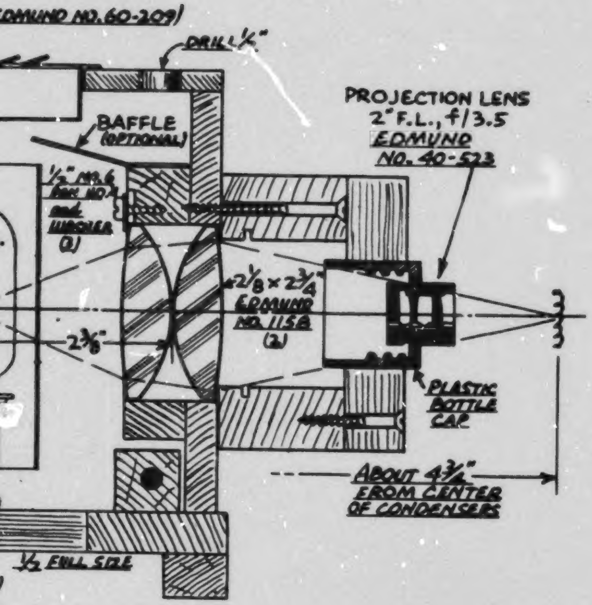
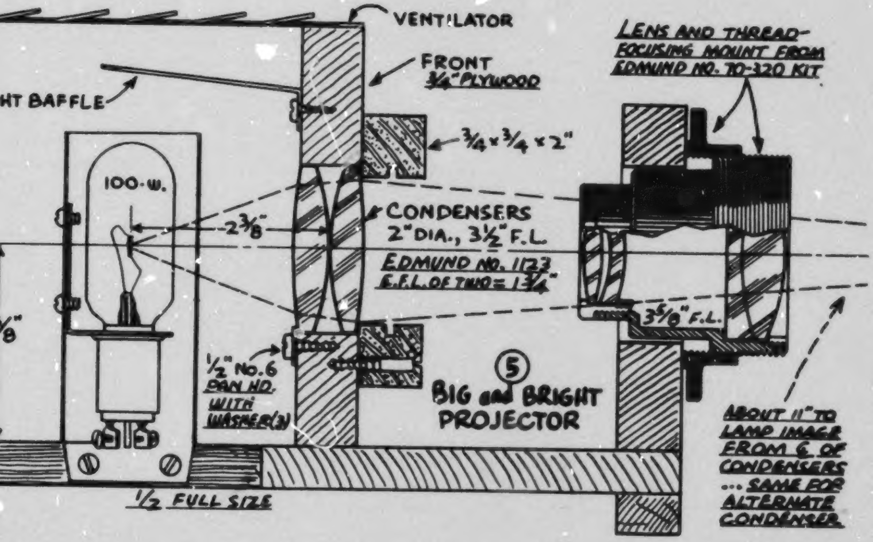
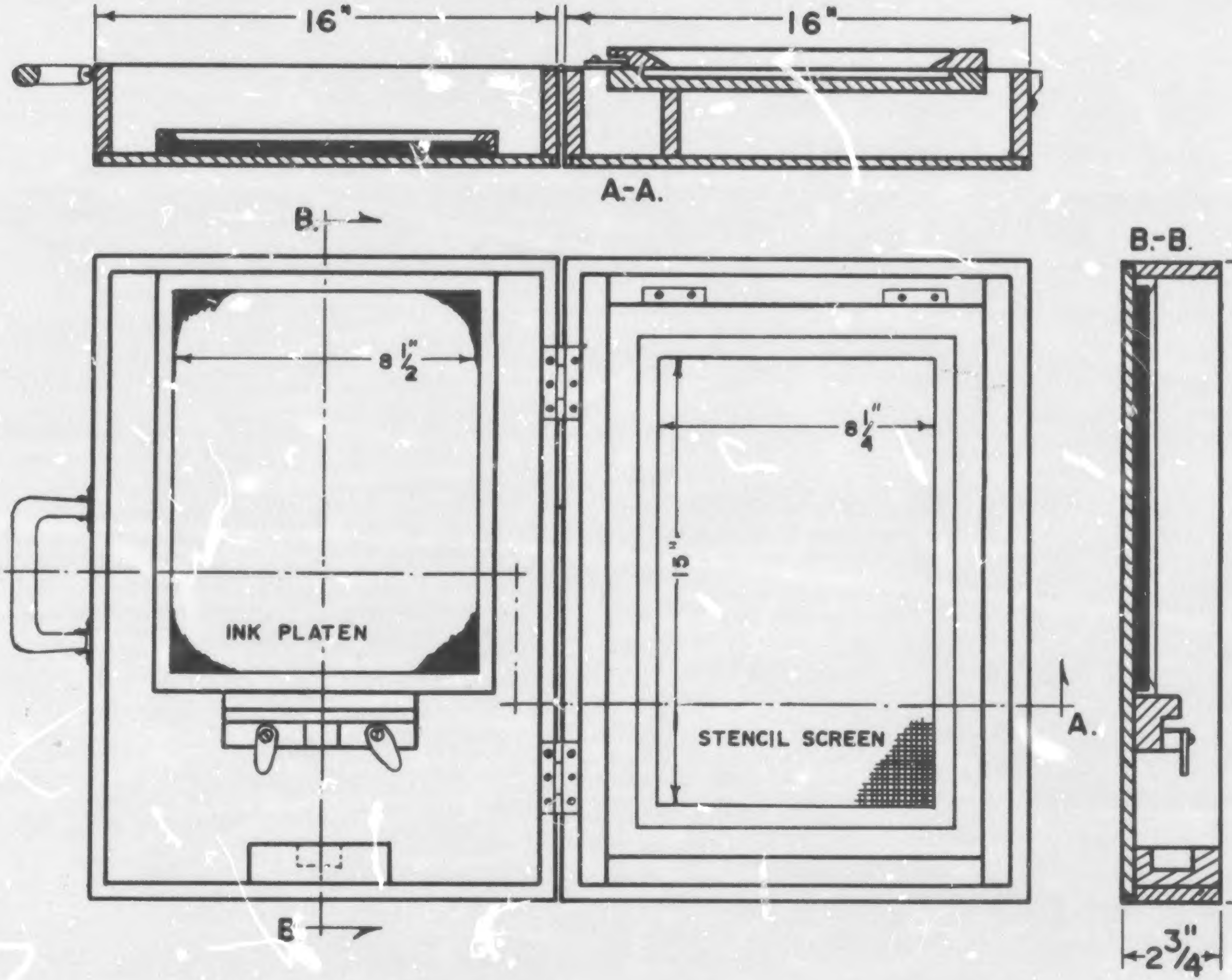

DMUND NO. 60-209)
DRILL 1/4"
BAFFLE (OPTIONAL)
1/2" NO.6 PAN HD. and WASHER (2)
2 1/8 × 2 3/4" EDMUND NO. 1158 (2)
2 3/8"
PROJECTION LENS 2" F.L., f/3.5 EDMUND NO. 40-523
PLASTIC BOTTLE CAP
ABOUT 4 3/4" FROM CENTER OF CONDENSERS
1/2 FULL SIZE


VENTILATOR
FRONT 3/4" PLYWOOD
HT BAFFLE
3/4 × 3/4 × 2"
LENS AND THREAD-FOCUSING MOUNT FROM EDMUND NO. 70-320 KIT
100-W.
2 3/8"
CONDENSERS 2" DIA., 3 1/2" F.L. EDMUND NO. 1123 E.F.L. OF TWO = 1 3/4"
3 5/8" F.L.
/8"
1/2" No.6 PAN HD. WITH WASHER (3)
ABOUT 11" TO LAMP IMAGE FROM ℄ OF CONDENSERS ... SAME FOR ALTERNATE CONDENSER
1/2 FULL SIZE

⑤ BIG and BRIGHT PROJECTOR

T COPY AVAILABLE



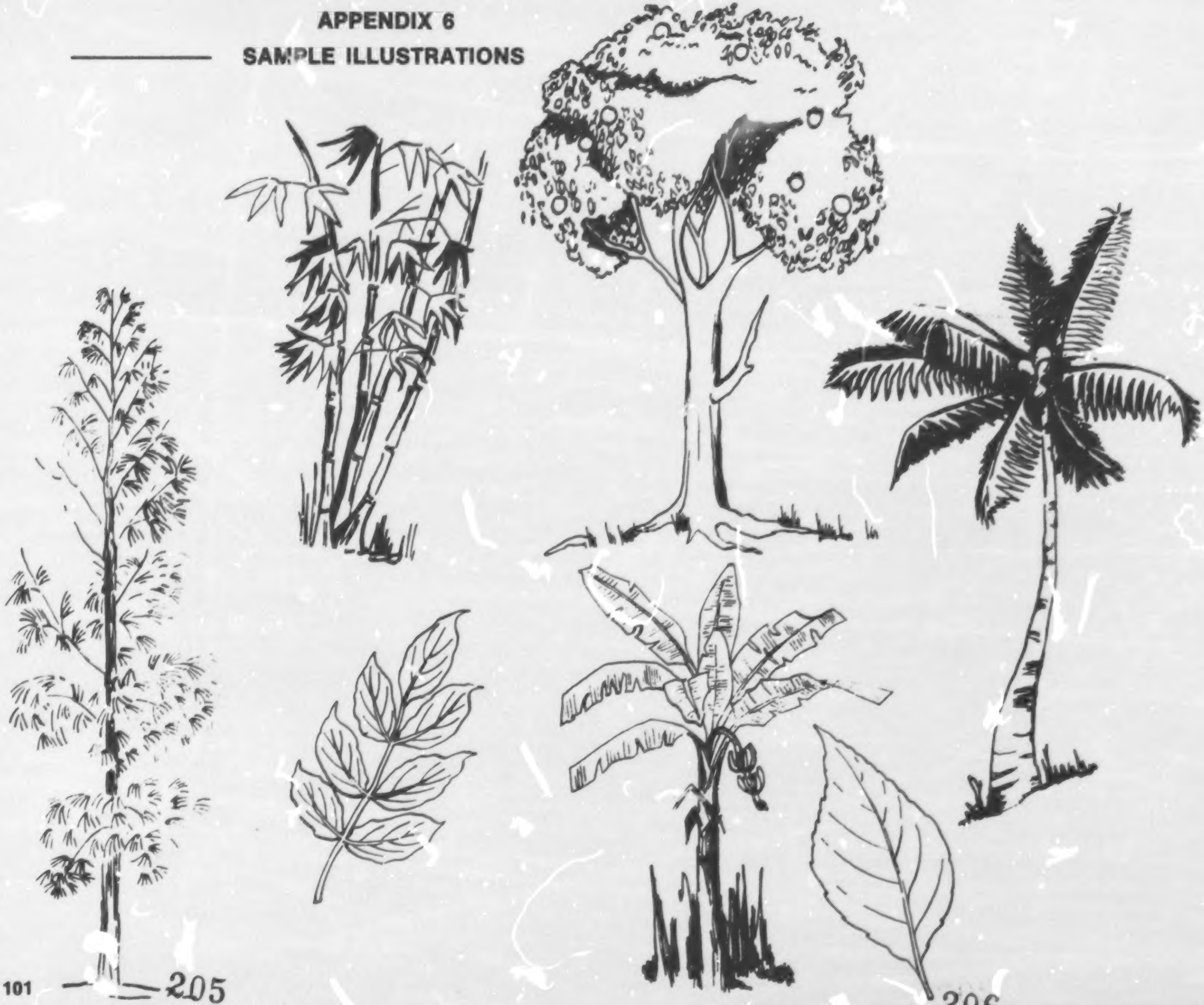
16"
16"
A.-A.
B.
B.-B.
8 1/2"
8 1/4"
15"
20"
A.
A.
INK PLATEN
STENCIL SCREEN
B
2 3/4"

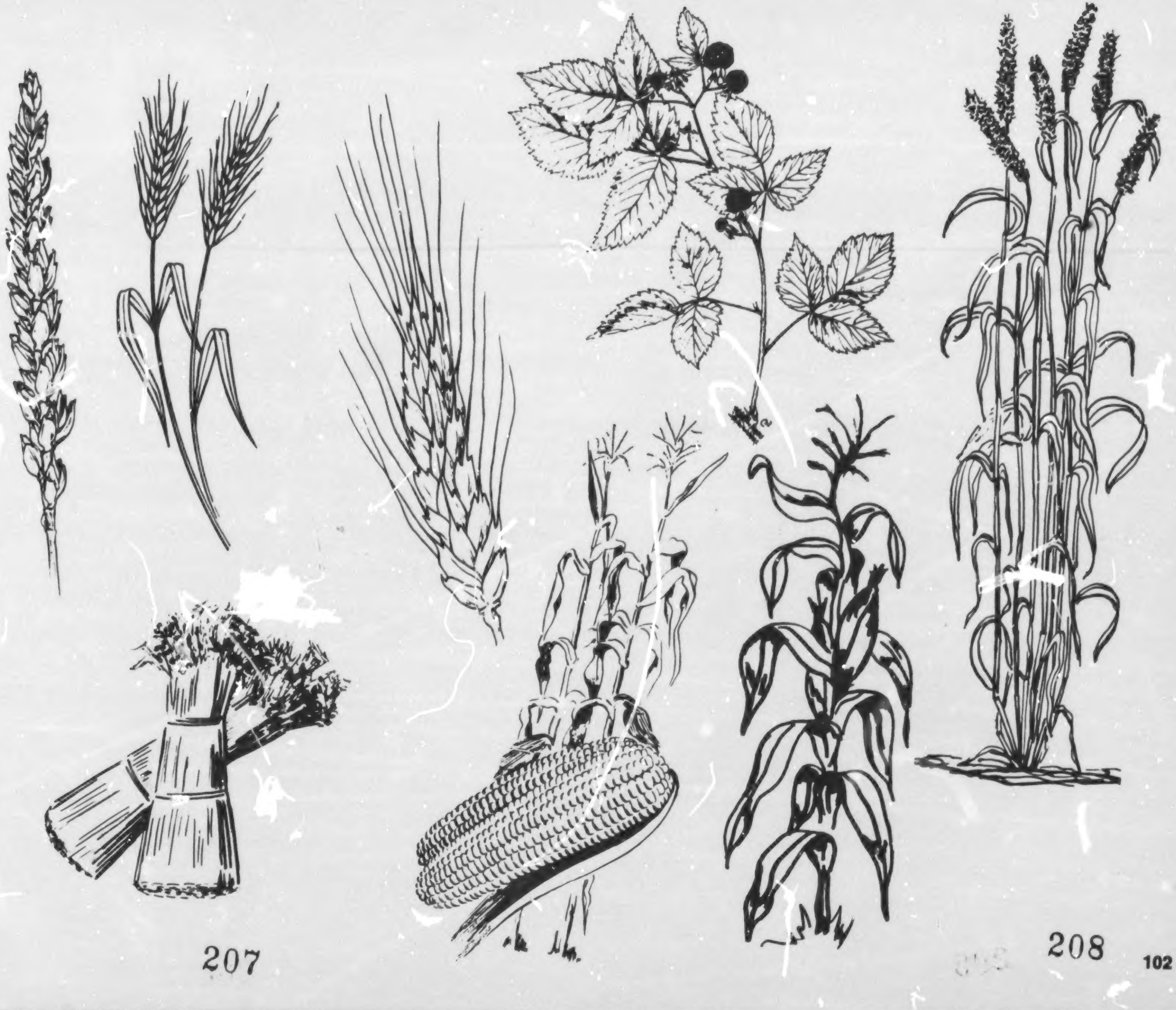
203

204

APPENDIX 6

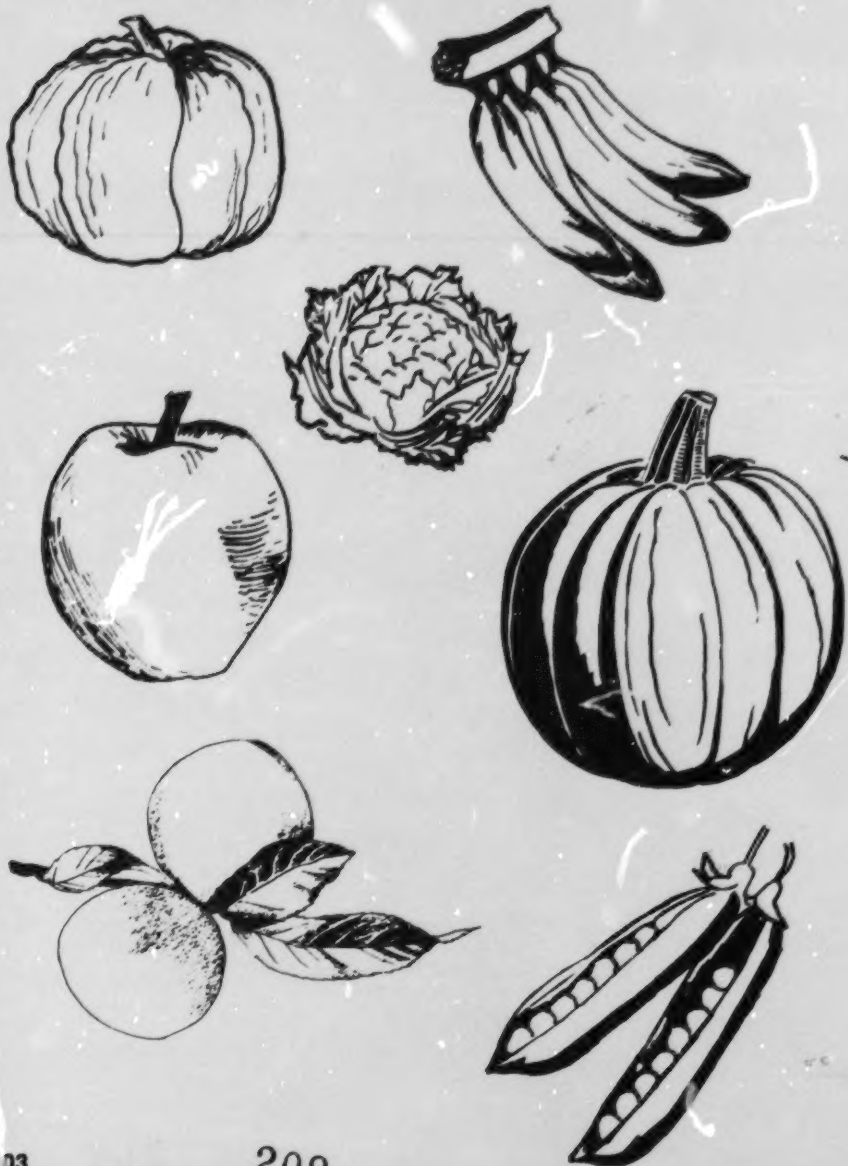
SAMPLE ILLUSTRATIONS





207

208



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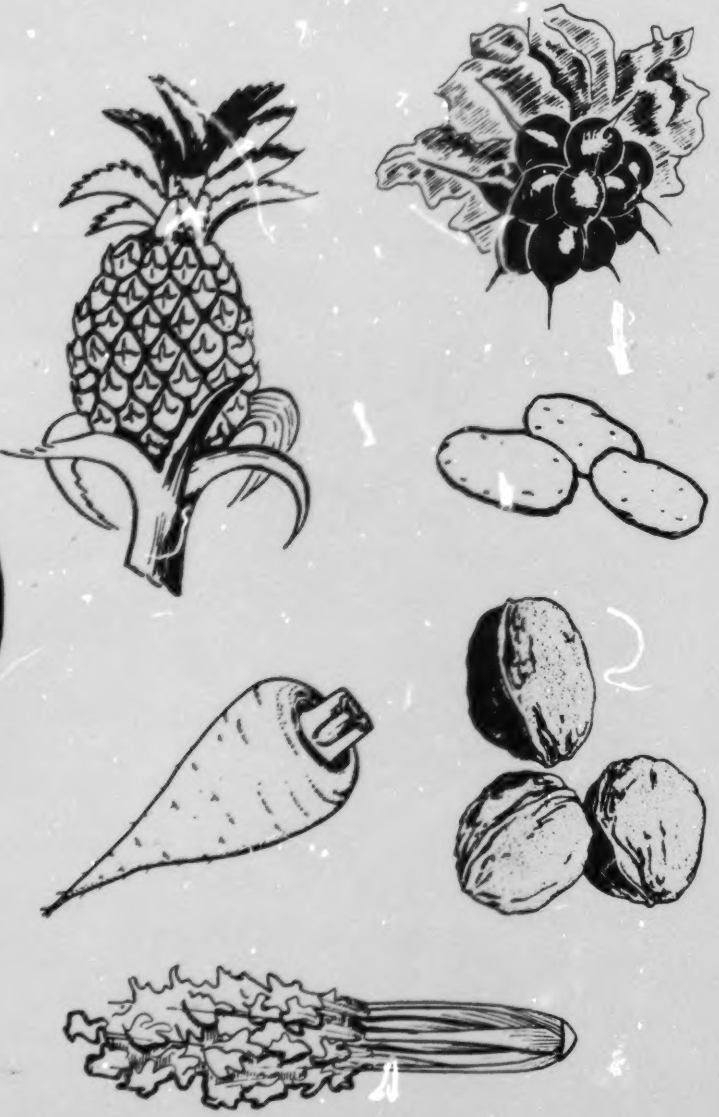

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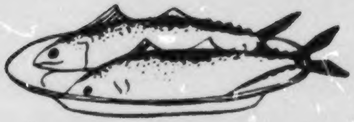
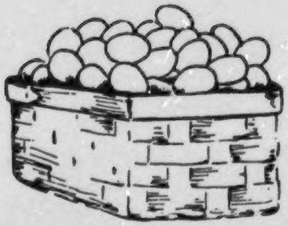
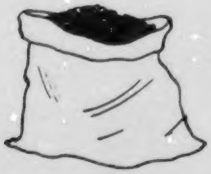
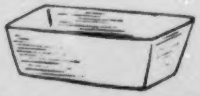
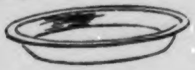
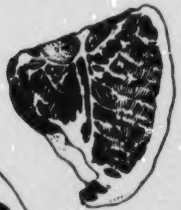


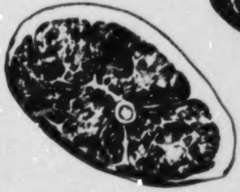


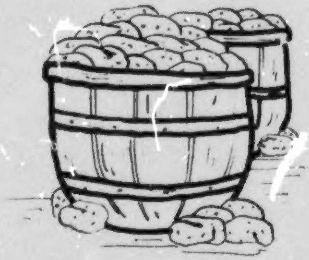


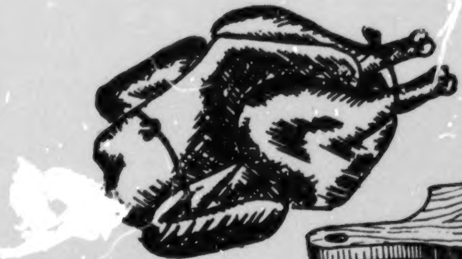


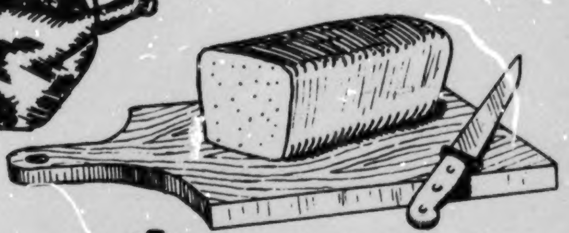


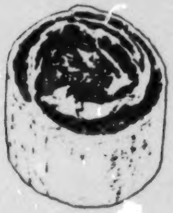


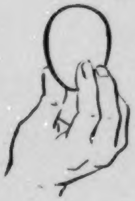


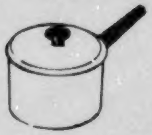


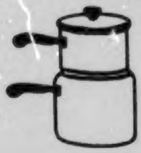


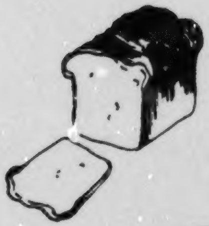


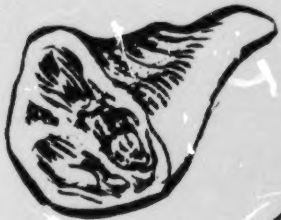


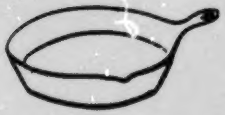


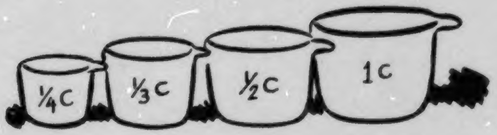


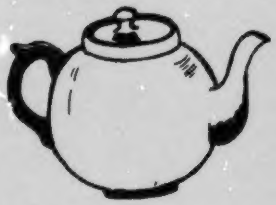


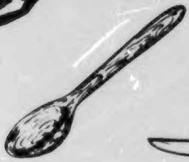


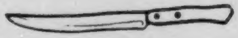


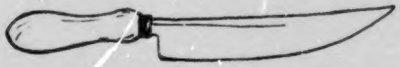


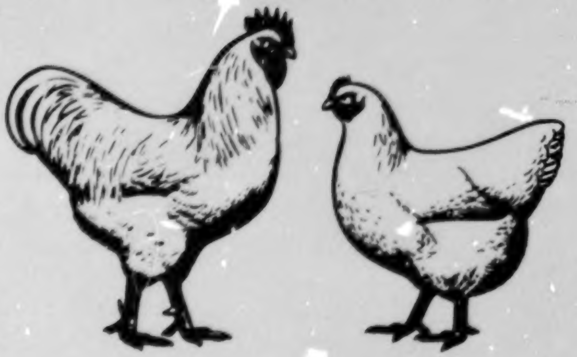

1/4 C
1/3 C
1/2 C
1 C

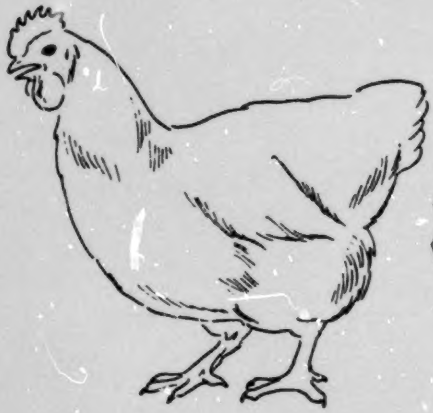


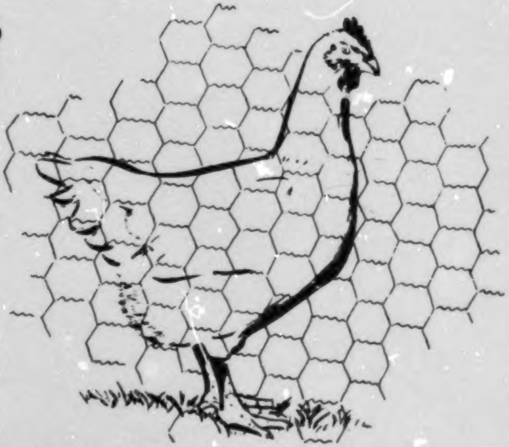


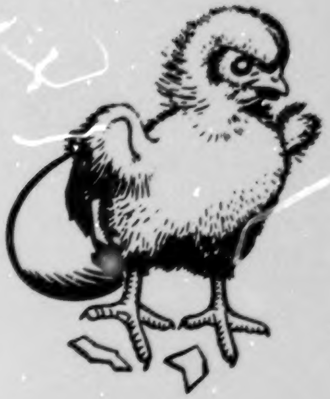


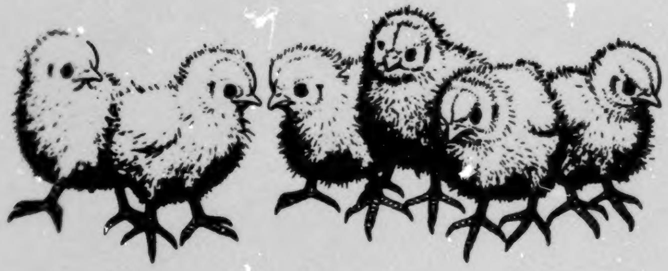


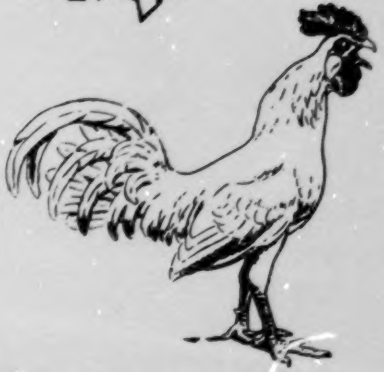


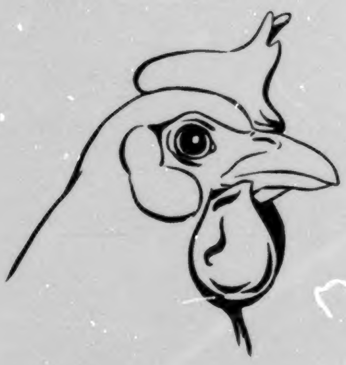


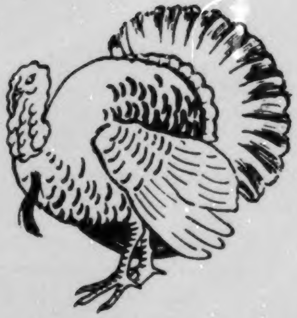












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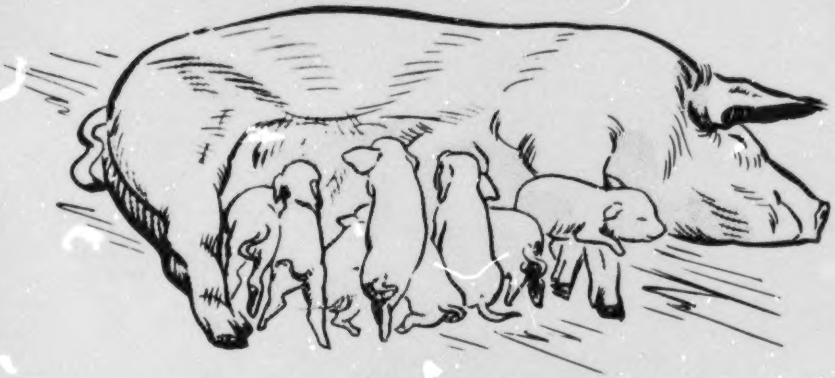

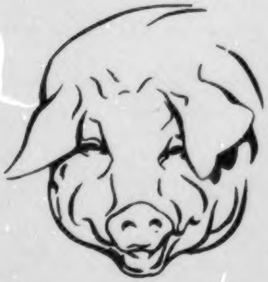

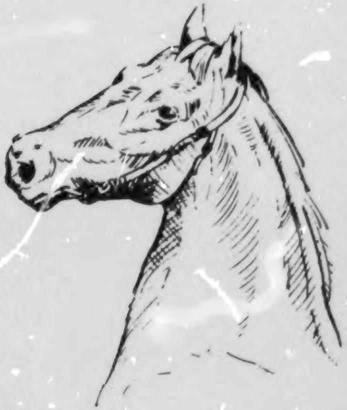

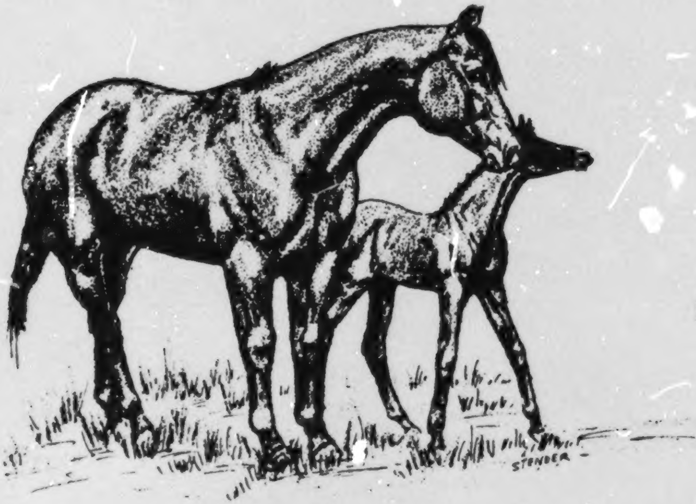

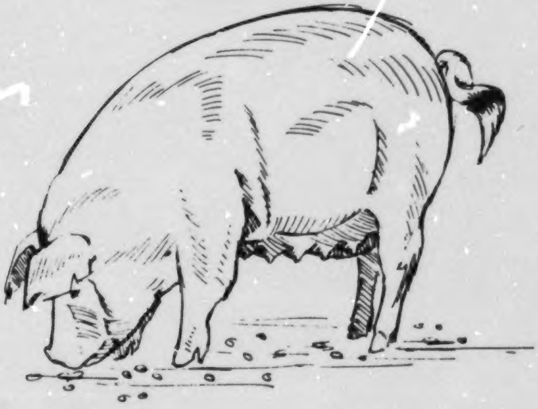

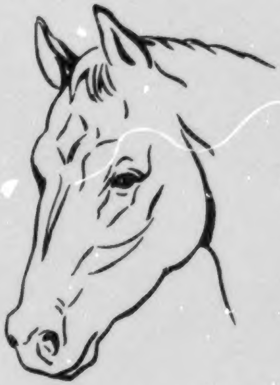

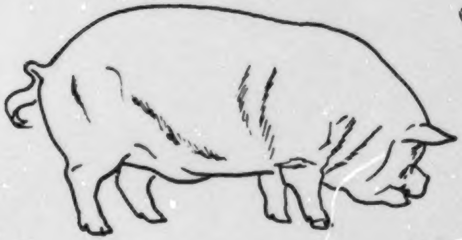

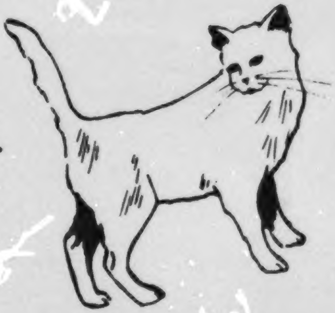

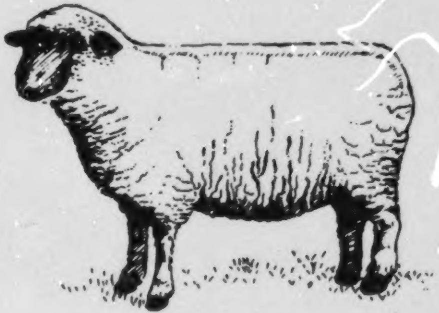

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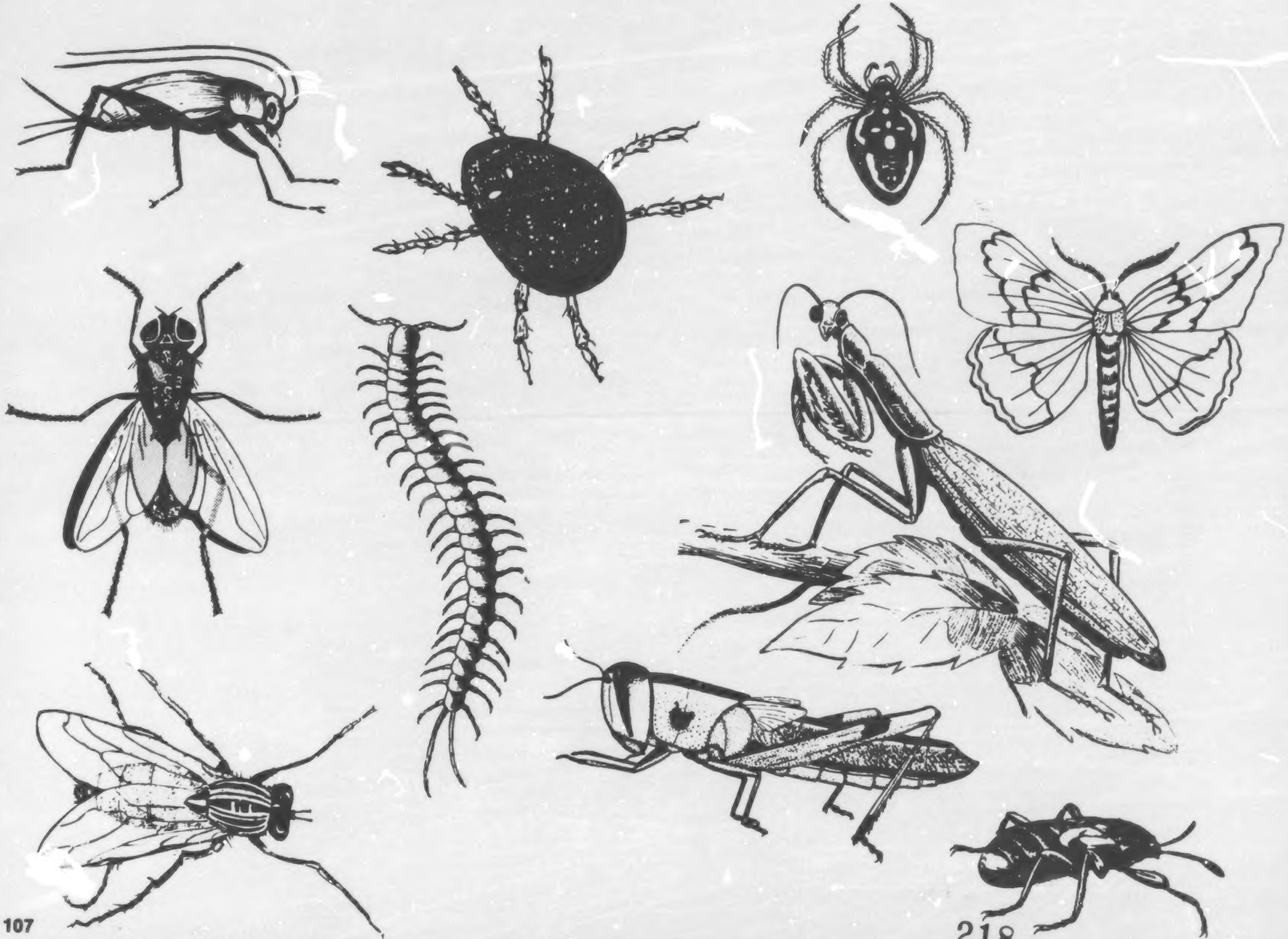

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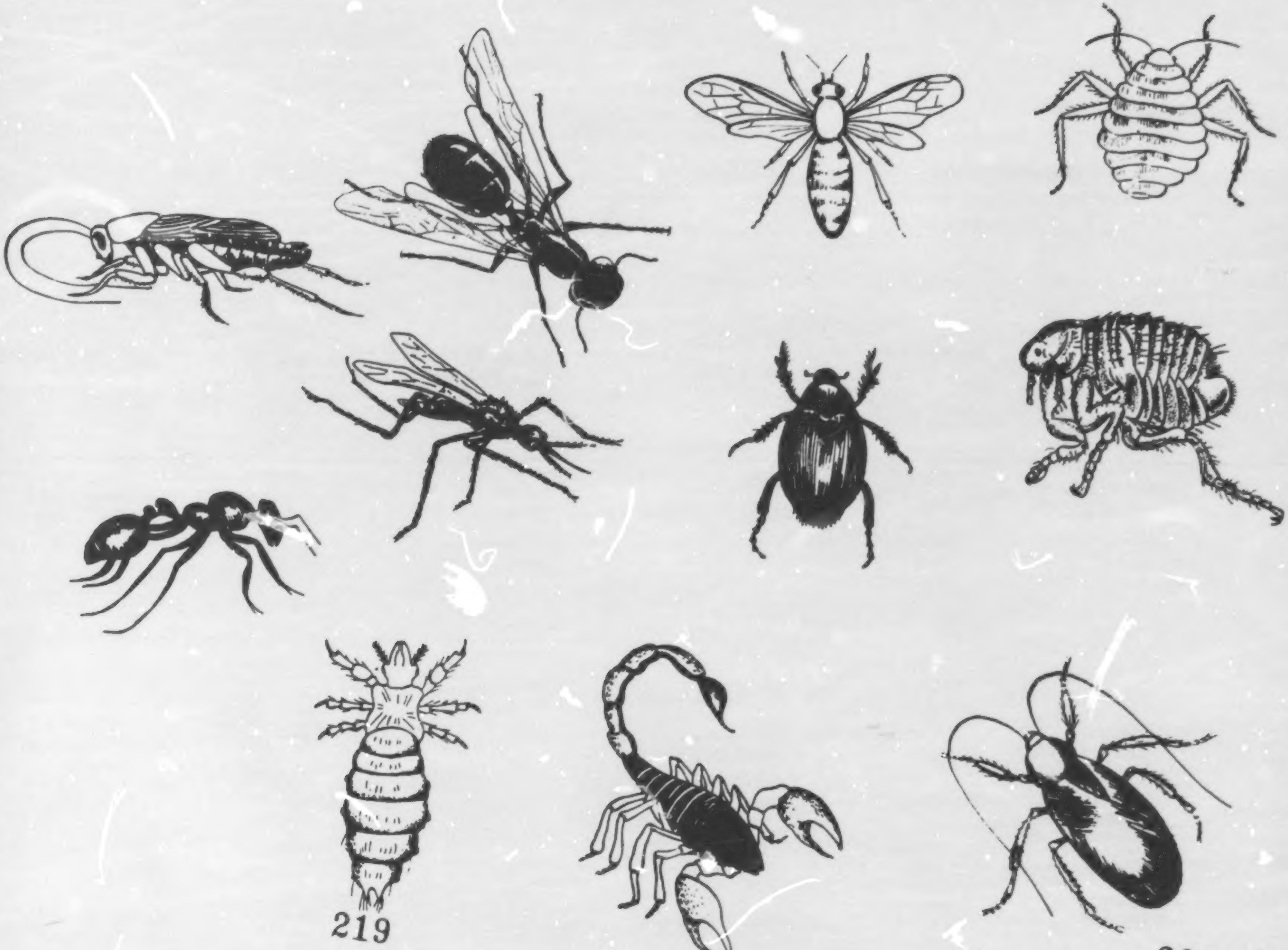

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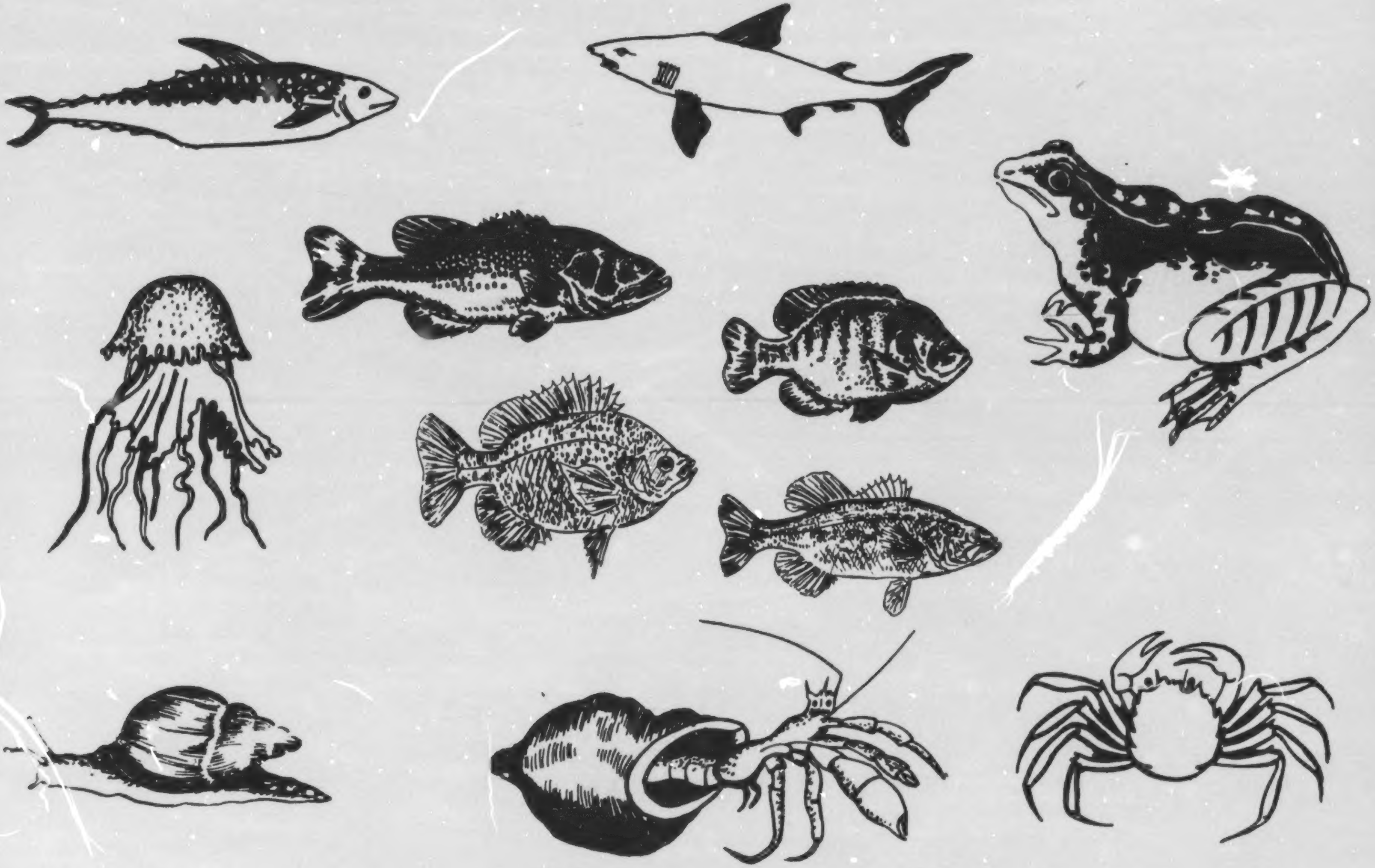

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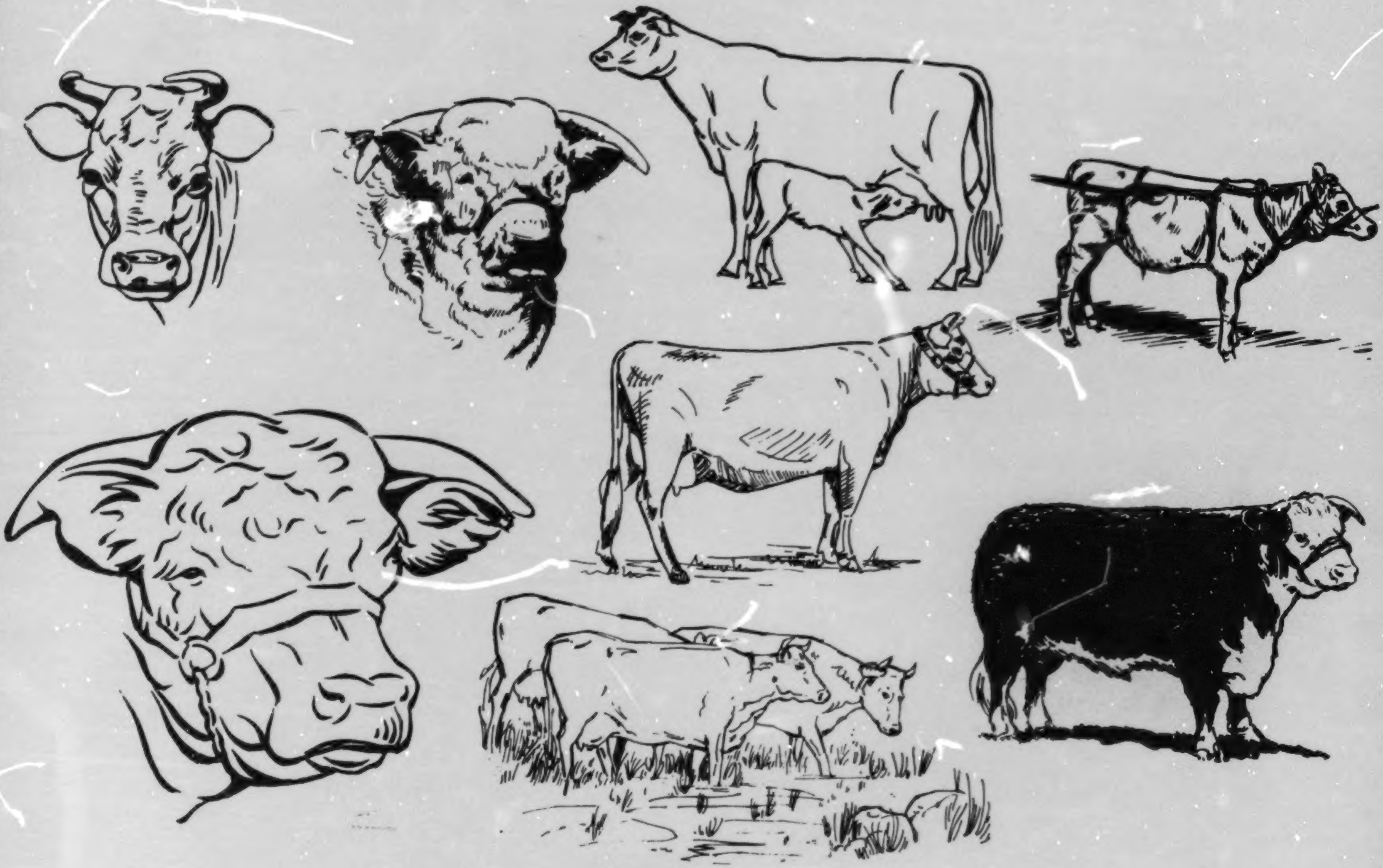

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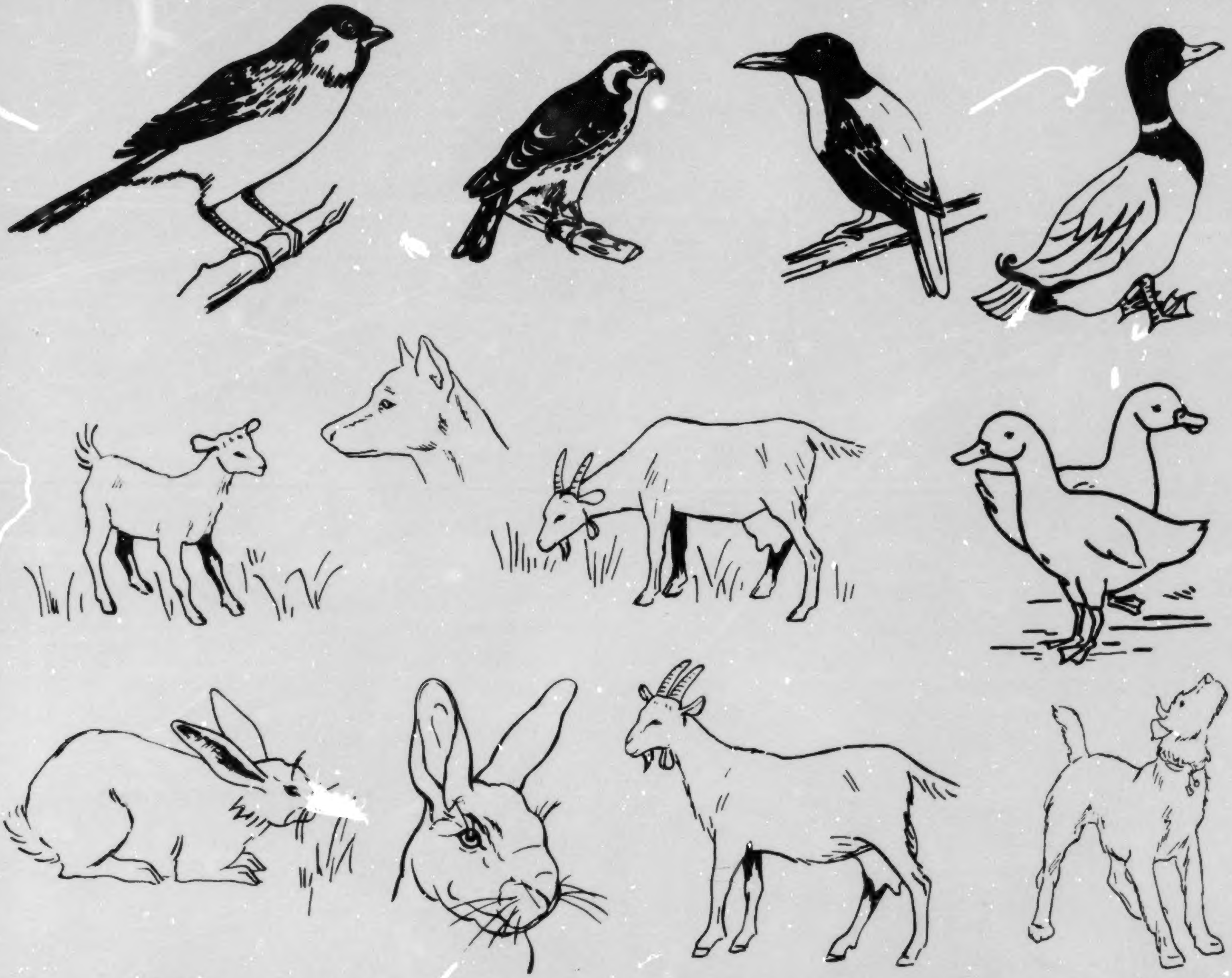

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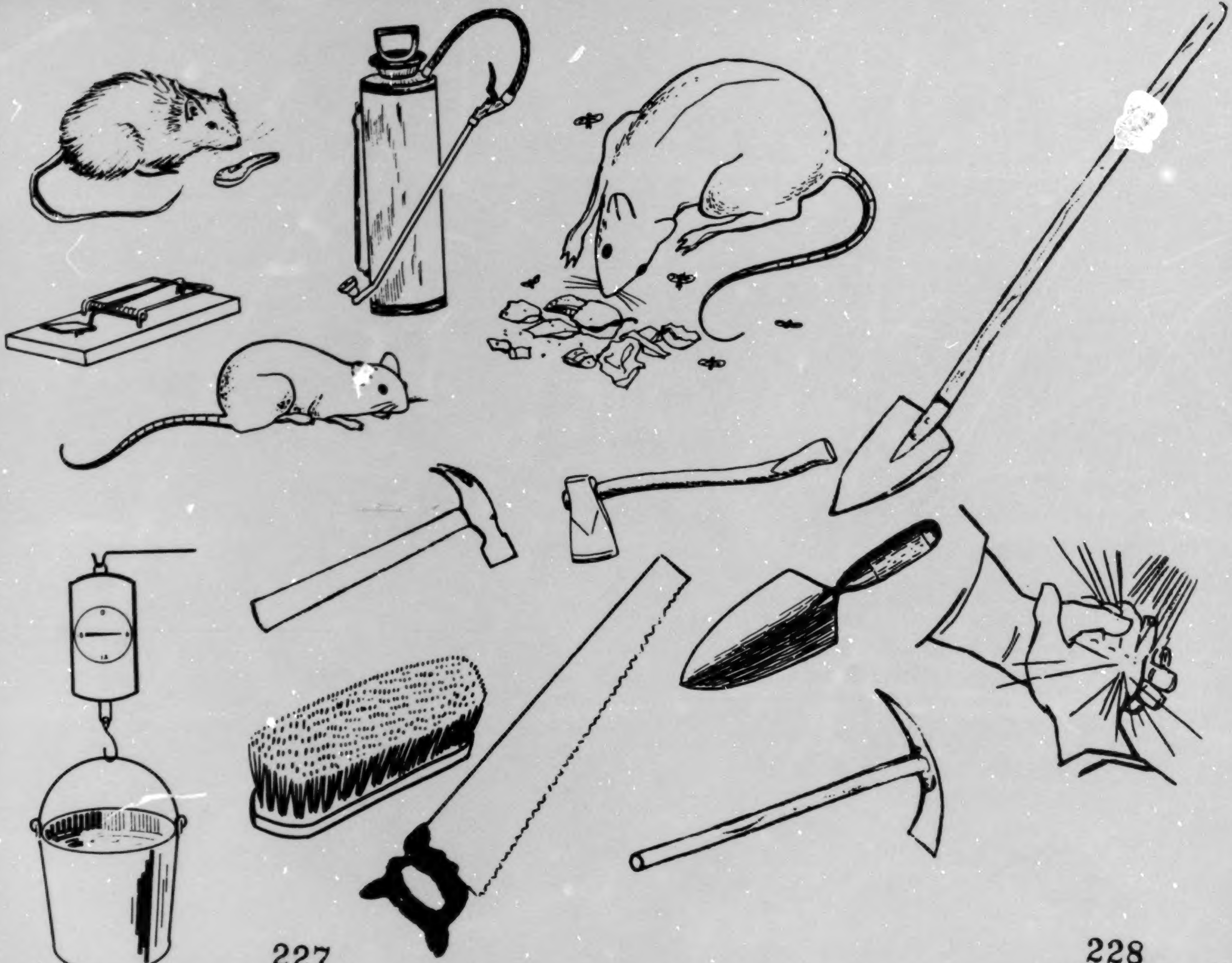

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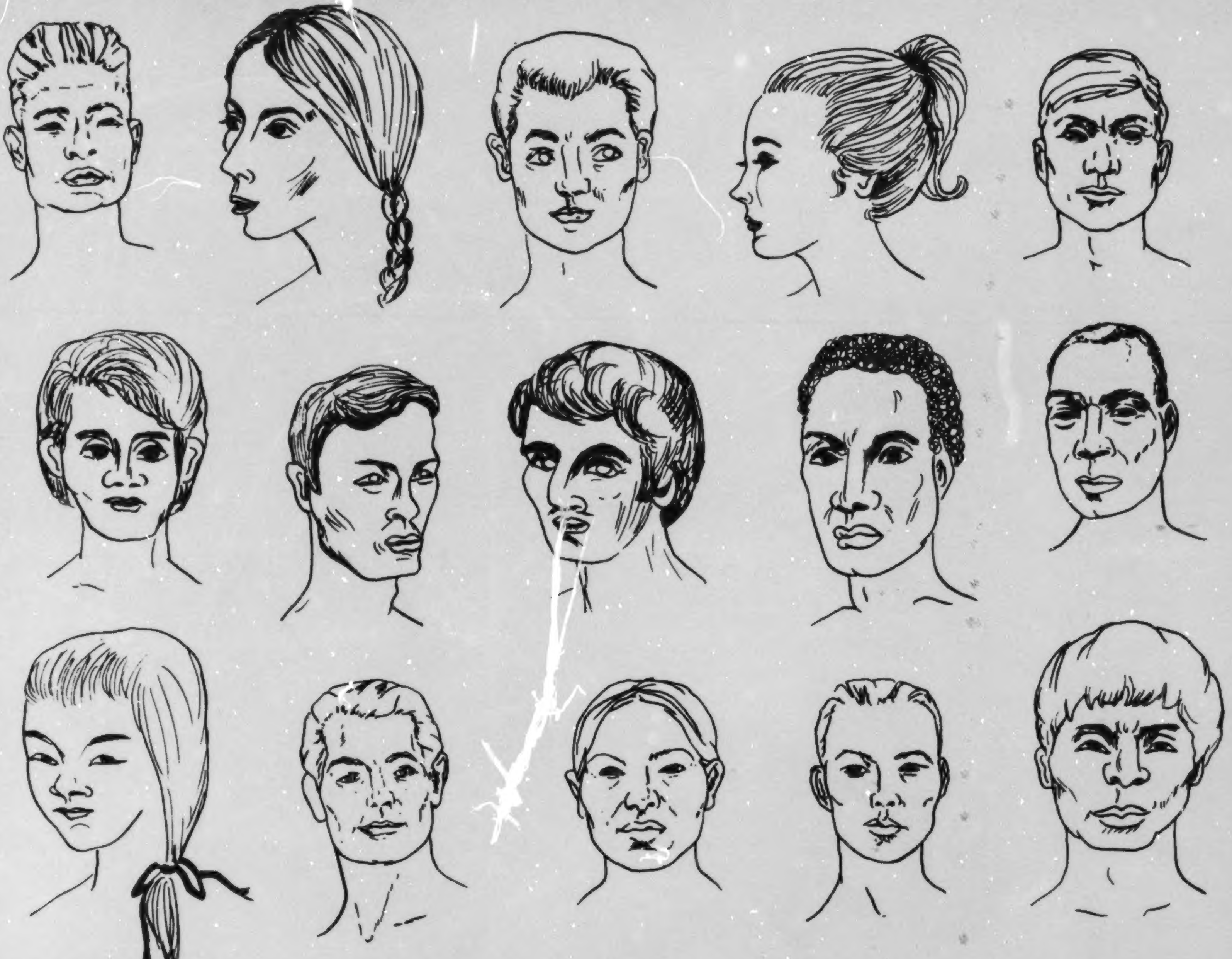

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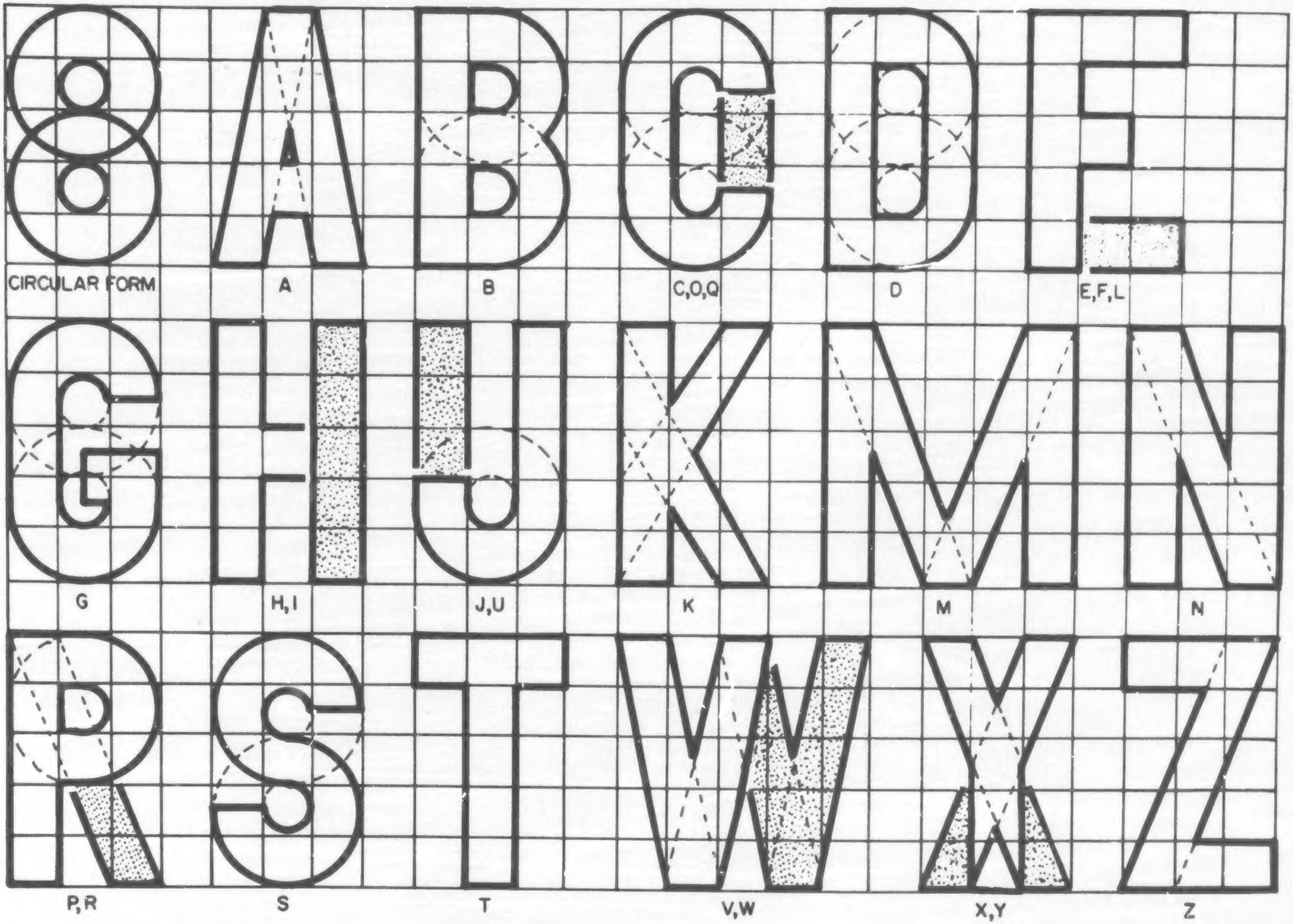
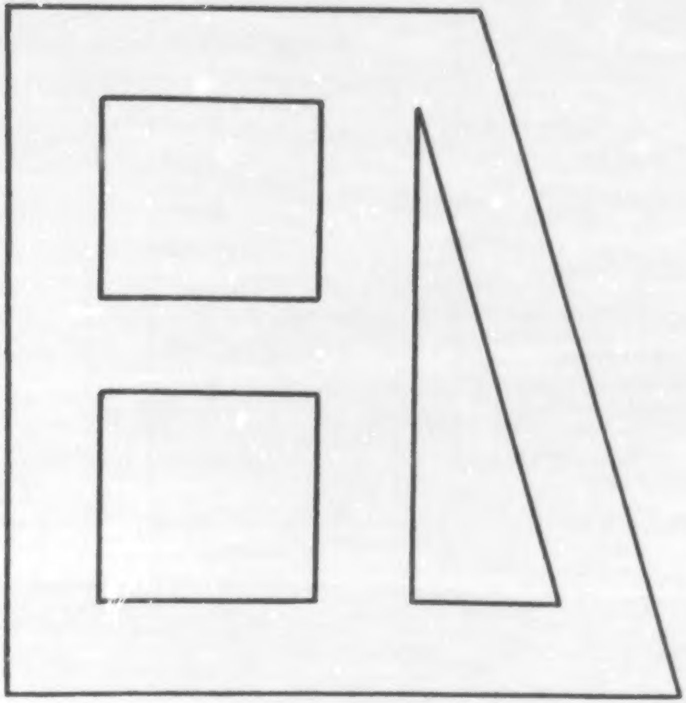
APPENDIX 7

LETTERING PATTERNS


CIRCULAR FORM
A
B
C,O,Q
D
E,F,L
G
H,I
J,U
K
M
N
P,R
S
T
V,W
X,Y
Z

Unistencil



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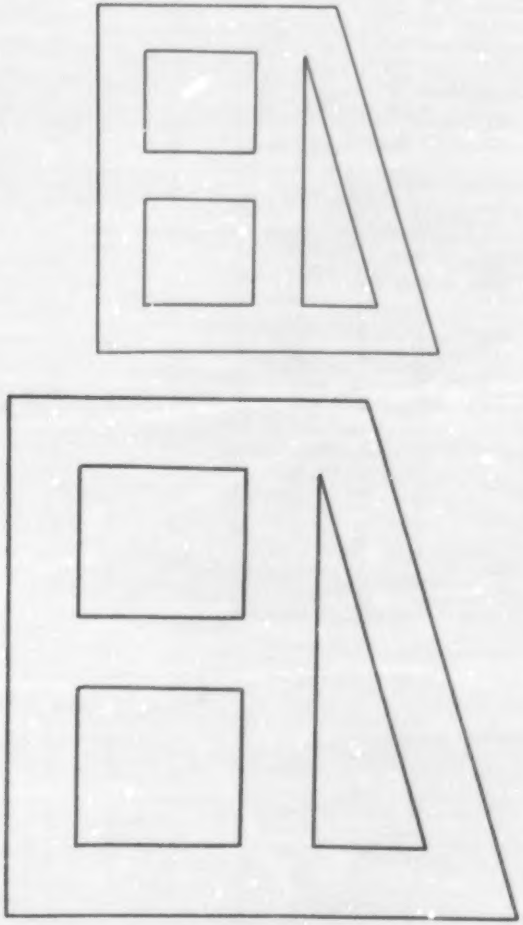

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APPENDIX 8

MEDIA COMPARISON CHART

VARIABLE

	USE CHARACTERISTICS			MATERIAL AVAILABILITY			EQUIPMENT COSTS			CHANNEL			AUDIENCE SUITABILITY				PACING		SEQUENCE		MOTION			ROOM DARKENING	
MEDIUM	MINIMAL SKILL	SOME TECHNICAL SKILL	CONSIDERABLE TECHNICAL SKILL	COMMERCIALLY PREPARED	SPECIALIST PREPARED	TEACHER PREPARED	0 - 20 DOLLARS	20 - 150 DOLLARS	150+	PRIMARILY AUDITORY	AUDITORY AND VISUAL	PRIMARILY VISUAL	LARGE GROUP 40+	MEDIUM GROUP 15 - 40	SMALL GROUP 2 - 15	INDIVIDUAL LEARNER	FIXED PACED	TEACHER OR LEARNER PACED	FIXED	NOT-FIXED	STATIC	MANIPULATIVE	CONTINUOUS	REQUIRED	NOT REQUIRED
PRESENTATION BOARDS																									
BULLETIN BOARDS	●					●	●					●		●	●	●	●		●		●	●			●
ELECTRIC BOARDS	●				●	●	●					●		●	●	●	●		●		●	●			●
FLANNEL BOARDS	●					●	●					●		●	●			●		●	●	●			●
MAGNETIC BOARDS	●				●	●	●					●		●	●			●		●	●	●			●
CHALKBOARDS	●					●	●					●		●	●			●		●	●	●			●
OTHER PRESENTATION MEDIA																									
CHARTS	●			●	●	●	●					●		●	●	●	●		●		●				●
POSTERS	●			●	●	●	●					●		●	●	●	●		●		●				●
WALL NEWSPAPERS	●			●	●		●					●				●	●		●		●				●
MAPS	●			●	●		●					●		●	●	●	●		●		●				●
FLASH CARDS	●					●	●					●		●	●		●			●	●				●
PUPPETS		●			●	●	●				●			●	●			●		●		●			●
MODELS		●		●	●	●	●	●				●		●	●			●	●	●	●	●			●
EXHIBITS		●			●	●	●	●				●			●	●	●		●		●	●	●		●
PROJECTED MEDIA																									
OPAQUE		●				●			●			●		●	●			●		●	●	●		●	
OVERHEAD		●		●	●	●			●			●		●	●			●		●	●	●			●
SLIDES		●		●	●	●		●				●		●	●		●	●		●	●			●	
FILM-STRIP		●		●	●			●			●	●		●	●		●	●	●		●			●	
8 - MM		●		●	●	●		●			●	●		●	●		●		●				●	●	
16 - MM			●	●	●				●		●		●	●			●		●				●	●	
NON-PROJECTED MEDIA																									
TAPE RECORDING		●		●	●	●		●		●				●	●		●		●		–	–	–		●
RADIO		●		●	●			●		●			●				●		●		–	–	–		●
TELEVISION		●		●					●		●		●				●		●				●		●

The above chart provides a summary of characteristics of a variety of media. The black dots indicate that the factor is characteristic of that particular medium, a blank indicates that it is not characteristic, and a dash indicates that the factor is not applicable. There are exceptions to some of the generalizations that are made on the chart. For example, teachers might prepare either 8 or 16 millimeter films, but the teacher would have to have some specialized production competencies. However, in general the factors checked hold true and can serve as a guide to the selection and use of media for specific purposes.

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APPENDIX 9

NOTES ON THE USE OF AUDIO-VISUAL EQUIPMENT

The difficulties encountered with audio-visual materials and equipment over-seas generally center around the physical environment. Extreme temperatures, moisture, sand and dust, insects, fungus, and bright sunlight all cause specific problems. In addition, electrical power sources vary widely and the equipment you use must match, or be adapted to match the local power sources. Some familiarity with the problems that can be caused by unusual conditions and ways to combat these problems will help you keep your equipment and materials in good condition.

Extreme Temperatures

Problems: High temperatures will cause equipment to overheat which in turn may dry up lubricants, cause rubber parts such as belts and drive wheels to deteriorate, and melt wax and plastic insulation. Similarly, dry cell batteries are damaged by heat.

High temperatures will cause films and other sensitized materials to deteriorate very rapidy. Six days at 120° will produce roughly the same aging as six months at 75°. Films will lose speed and contrast, and mottled spots are likely to result. Color reproduction will be noticeably poorer with all color films.

Remedy: Store equipment in as cool a place as possible. When traveling in hot areas, a styrofoam picnic chest is an ideal place to store equipment. For ventilation during storage and operation, allow air space around equipment. Be sure that ing to the instruction booklet or service manual. Be sure equipment, especially lenses, is clean before storing. This will help avoid fungus growth.

Try to purchase film that is fresh and tropically packed. Information on the box will help you know what you are buying. Fresh film will have a date a year or more in the future. Always store film in a cool place. The shelves of a refrigerator are ideal for storing unopened packages, but once opened, packages should not be put back as moisture will be equally damaging. The ideal temperature for storage is about 55°. After removing a package of film from a refrigerator, allow it to warm up before opening to avoid condensation. On a hot sunny day a closed car or glove compartment is probably the worst possible place to store film either in or out of the camera. This common habit should be avoided at all times.

Problem: Below-freezing temperatures can cause rubber and some plastic parts to become brittle and eventually to break. The lubricants in projectors, tape recorders or other equipment with moving parts will thicken in extreme cold and slow down the running speed.

Remedy: Protect equipment from the cold. Where possible, oil moving parts with special low temperature lubricants.

Problem: When equipment is taken from a cold place to a warm humid room, moisture will condense on cold metal. This is damaging to any precision equipment.

Remedy: Protect equipment from the cold. Cameras, film and small equipment can be carried inside your coat where body heat will keep it warm. Try to prevent condensation by avoiding rapid temperature changes. If condensation does occur, carefully wipe off the condensed moisture. If condensation has formed when there is film in the camera and you want to take pictures, wait until the moisture on the outside has evaporated, then wait a bit longer. This is a good indication that moisture on the inside of the lens has cleared. Lens cleaning tissue should be used on optics, but any soft tissue can be used if you are careful to avoid rubbing.

Moisture

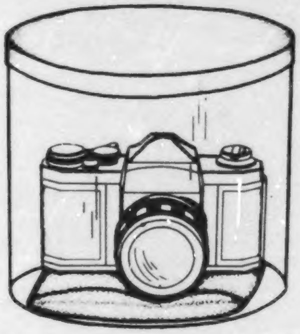
Problem: Moisture and audio-visual equipment are incompatible. Moisture can cause electrical problems, oxidize metal, promote fungus growth, and cause leather to deteriorate.

Remedy: Protection from all moisture is excellent insurance. A plastic bag around equipment is probably the best way to keep things dry. Wrap the equipment in a clean cloth before putting it in a plastic bag. A very light coat of thin oil on exposed surfaces and a coat of wax or leather preservative on leather surfaces can reduce problems.

Despite care, sometimes you may get rain water or even salt water on equipment. As quickly as possible, wipe all the water off exposed surfaces and oil lightly. If you suspect that salt water has seeped into your camera, rinse in fresh water (distilled if possible), then send it to the nearest professional repairman or to the factory for cleaning.

Problem: High humidity can be as damaging as direct water and usually is not noticed as quickly. It will cause the same equipment problems as other moisture.

Remedy: Humidity can be controlled in several ways. A storage closet with a dehumidifier is ideal if available. A good substitute is a closet with a small heater or a lamp near the floor and ventilation holes at the top. Slatted shelves and careful placement of equipment to allow air circulation will help reduce moisture still further. Small equipment can also be stored in a sealed container with a desiccant such as silica gel, calcium chloride, or dried rice. Silica gel is sold in small cloth bags which have a moisture indicator on the outside. Place the desiccant bag and your camera or other small equipment in a large-mouth jar with a screw top. When the indicator shows the desiccant is saturated, it can be placed in an oven at a temperature of 400 degrees for a couple of hours to dry it out. Stir silica gel occasionally while drying. It will look pink/white when saturated and blue when dry.



Larger pieces of equipment can be stored in a box with a tight fitting lid and some desiccant. A picnic chest is ideal. Do not store leather cases with your camera as the leather probably holds a potentially damaging amount of moisture, and usually holds fungus spores.

Problem: High humidity is equally damaging to many graphic and photographic materials. Moisture on film will cause problems similar to those produced by heat.

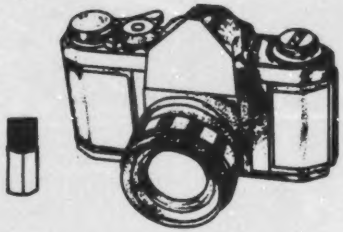
Remedy: Use tropically packed film and store it in a cool, dry place until used. After a package of film has been opened, use it and have it processed as soon as possible. If it must be stored, use a closed container with a desiccant.

Graphic materials such as paper, cardboard, and mounting materials should be kept dry. A closet with slatted shelves and some means of drying and circulating the air will work well. Processed films are very susceptible to moisture damage. Negatives and slides should be protected by storage in a cool, dry place. Slides mounted in aluminum or plastic mounts are less likely to be damaged by moisture than those in cardboard mounts because the cardboard itself absorbs moisture. Glass mounts increase the chance of fungus growth. Filmstrips should be placed in a metal or plastic container with a loose-fitting top (or the top removed) and stored in a dry container. Be careful to avoid all finger marks on slides or filmstrips.

Sand and Dust

Problem: Sand and dust can get into almost any equipment and cause faulty operation of volume controls, tone controls, switches, shutters, and timers. Even small amounts of dust and dirt will cause film scratching in cameras and projectors and will cause excessive wear of tape recorder heads and all moving parts.

Remedy: When not in use, store all equipment in dustproof cases or plastic bags. Clean equipment frequently! Cleaning should be done with a soft cloth or a soft brush. Lenses should be cleaned with a lens brush and lens tissue. Other soft tissues can be used, but **never** use silicone-treated tissues which damage the surface of coated lenses used in most modern cameras. If sand does get into a camera shutter or projector mechanism, do not try to operate until it has been thoroughly cleaned.



Fungus

Problem: Fungus growth, usually associated with warm, humid conditions, can damage lenses, leather goods, paper products, photographic materials, projection screens, and other materials.

Remedy: The general rules for equipment care in tropical climates will help you avoid fungus damage. Keep all equipment and materials dry and reasonably cool. Antimildew powders are available, but they may affect photographic materials. Prevention is much better than cure. If fungus does start to grow on lenses, color slides, or other materials, clean them as quickly as possible. A soft cloth and a film-cleaning solution, available from most photo dealers, will remove light fungus if caught in time. Plastic projection screens can be washed with warm soapy water and dried thoroughly. Projecting films and slides occasionally and keeping all equipment clean and dry is the best deterrent to fungus growth.

Insects

Problem: Insects can cause a variety of problems to many kinds of equipment. They can jam delicate mechanisms in cameras, projectors and tape recorders. They can eat insulation on electrical equipment causing short circuits, and they can damage projection screens with stains that are difficult to remove.

Remedy: Keeping equipment in closed containers and dusting lightly with insecticide can help prevent insect damage. Ventilation holes in equipment can be covered with fine mesh screen to prevent insects from entering, but be careful not to block off all air circulation. Do not roll up a projection screen immediately after an evening film showing. Insects rolled up in the screen cause stains that are difficult to remove.

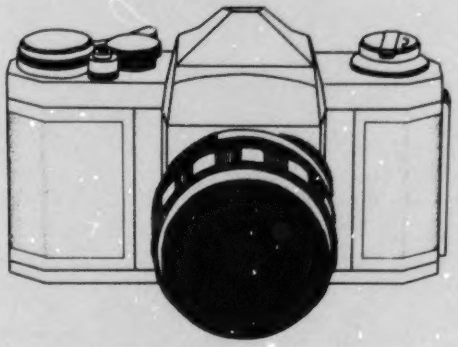
Bright Sunlight

Problem: Excessive, intense sunlight can cause damage by bleaching colors in paper, cloth and photographic materials. Dial markings on some equipment and many plastics can be damaged by continued exposure to strong sunlight.

Remedy: Protect equipment and materials from direct sun whenever possible.

There are a few general suggestions regarding equipment that will help you to avoid many problems:

1. Obtain simple, rugged equipment rather than complicated equipment even if it means sacrificing some versatility.
2. Transistorized electronic equipment generates less heat and is lighter in weight than tube-type equipment. However, transistorized electronic equipment is also a bit more difficult to repair.
3. All photographic materials should be kept dry and cool (not frozen) and processed as soon as possible after shooting. In most places, sending film to the lab by air will reduce the chance of damage. If you must leave film in the camera, keep it in a desiccated container in a cool place.
4. All electronic equipment is susceptible to moisture. Keep it dry. Electronic flash units can be purchased that use rechargeable batteries or disposable batteries. The rechargebale units tend to be more delicate, but they are more economical when many flash pictures are to be taken and correct power sources are available for charging. Disposable units are less susceptible to damage, but batteries must be replaced occasionally and are sometimes difficult to find.
   Whenever possible, use sealed, dry batteries in your electronic equipment. They have longer life and are less likely to leak. Always remove exhausted batteries from equipment to prevent damage from leakage.
5. Lenses of all kinds should be well protected. Covers are essential when not in use. When in use, a haze or ultraviolet filter over the lens will protect it from moisture and dust.

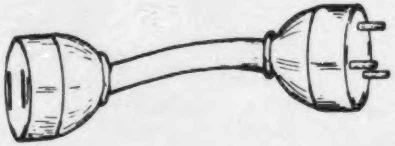


6. Keep tape recorder heads clean, and remove dust and oxide carefully with a recommended tape recorder cleaning solution or alcohol (spirits). **Do not use alcohol on the pressure roller as it will cause the rubber to deteriorate.**
7. When buying projection bulbs try to get bulbs that are rated higher than the normal line voltage, i.e., order 230-volt bulbs if the line voltage is normally 220 volts. Order 115-volt bulbs if the line voltage is normally 110 volts. This will reduce damage due to upward voltage surges.
8. **Always read instruction books carefully.**

Electrical Considerations

The electrical requirements for most audio-visual equipment can be understood easily even though they are sometimes clouded in seemingly meaningless nomenclature. A few guidelines can help you avoid problems of blown fuses or burned out motors and lamps.

- **There are four characteristics of electrical power supplies that need to be considered.**
  1. The kind of current expressed as AC (alternating) or DC (direct) current. Most generator plants produce alternating (AC) current. Dry cells, car batteries, and some generators furnish direct (DC) current.
  2. The pressure or voltage of the current.
  3. The amount of current available or used by a piece of equipment or appliance measured in amperes.
  4. The frequency of alternating power sources expressed in cycles per second.
- **You must match the electrical requirements of the equipment you are using to the available source.** The instruction booklet and the nameplate on most equipment states the amount and kind of voltage required, the current consumption in amperes and the cycles, if applicable.
  1. Use the proper kind of power. If you operate motors, heaters, amplifiers or lamps on the wrong kind of current (AC instead of DC, or vice versa), they may not operate and they can be seriously damaged.
  2. Match source voltage to equipment requirements. With low voltage most equipment will not operate properly and can be damaged. Excessively high voltages will almost always cause serious damage. Transformers can be used to reduce the 220 voltage found in many places to the 110 volts required for most United States' equipment. It is well to note that the voltage of electricity supplies can vary widely. A shortage of generating equipment in many countries results in overloads and decreased voltage during periods of high use. It is entirely possible that voltage can vary from less than 100 volts to as much as 240 volts in a few hours.
  3. Check to be sure there is ample current available to run your equipment. The current available usually depends on the fuses that are in the circuit. A fuse is a safety device that will burn out if the circuit is overloaded with too many lamps, motors, heaters, etc. If there were no fuses, the wiring or even the generator might burn out causing power failure and/or a fire. Most circuits in schools, houses, and offices are fused for about 15 amperes. The amperage used by a piece of equipment is usually on the nameplate. Sometimes wattage is given instead. In that case divide the wattage by the voltage to find the amperes. For example, a 500-watt projector on a 110-volt line will use about 5 amperes. Remember that equipment in several rooms of a building may be operating on one circuit. The total amperes being used is equal to the sum of the amperes of the individual pieces of equipment in use.
  4. Using current of the wrong number of cycles will not damage equipment, but motors will run at the wrong speed. A 50-cycle tape recorder will run 20 per cent faster if operated on a 60-cycle line.
- **Try to purchase equipment that is designated for the electrical sources available to you.** Many items are now available with relatively simple adjustments to adapt to varying voltages and cycles.
- **Carry a stock of adapters that will enable you to use your equipment with a variety of wall receptacles.** In some places as many as four different receptacles can be found in the same building. It is always a good idea to carry an extension cord as they are needed frequently.



- **Carry spare bulbs, fuses, batteries and other items with a short life.**
- **Always be careful where electricity is concerned.** Never use makeshift electrical connections. A mistake can be fatal.

APPENDIX 10

SOURCES OF INFORMATION

Sources

In addition to assistance available from the Peace Corps, volunteers are encouraged to use sources available in their respective countries. In many countries these include:

Embassies and Consulates of other nations

Food and Agriculture Organizations of the United Nations

Ministries or Departments of Agriculture, Community Development, Education, Health, Information. etc.

United States Information Service
United States Agency for International Development

United National Educational, Scientific and Cultural Organization

The British Council

World Health Organization of the United Nations

There are several organizations that can provide information on the planning, production, use, and evaluation of media in developing nations. These include:

Overseas Visual Aids Centre
Tavistock Square
London W. C. 1

Centre for Educational Television Overseas
The Studio, Nuffield Lodge
Regent's Park, London NW1

Regional Technical Aids Center
United States Agency for International Development
c/o United States Embassy
Mexico City 5, Mexico

Regional Technical Aids Center
c/o United States Embassy
Paris, France

U.N.E.S.C.O.
Place de Fontenoy
Audio-Visual Center
Paris 7^{e}, France

Audio-Visual Center
Indiana University
Bloomington, Indiana 47401

In addition, many organizations in the United States can provide information of value to Peace Corps volunteers in developing instructional materials.

Asia Foundation
550 Kearney Street
San Francisco, California 94108

CARE
1028 Connecticut Avenue, N.W.
Washington, D.C. 20036

Credit Union National Association
P.O. Box 431
Madison, Wisconsin 53701

Department of Agriculture
Independence Avenue, N.W.
Washington, D.C. 20015

Food and Agriculture Organization
Public Information, Room 1560
1325 C Street, S. C.
Washington, D.C. 20437

Head Start
1111 Eighteenth Street
Washington, D.C. 20506

Health, Education and Welfare Department
Office of International Affairs
2221 Jefferson Davis Highway
Washington, D.C. 20202

Heifer Project, Inc.
P.O. Box 269
North Manchester, Indiana 46962

Housing and Urban Development
451 Seventeenth Street, S.W.
Washington, D.C. 20000

International Cooperative Training Center
University of Wisconsin
University Extension
Madison, Wisconsin 53706

International Education Development
211 East 87th Street
New York, N.Y. 10028

Modern Language Association of America
62 Fifth Avenue
New York, N.Y. 10011

National Education Association
1202 Sixteenth Street, N.W.
Washington, D.C. 20036

National 4-H Club Foundation
7100 Connecticut Avenue, N.W.
Washington, D.C. 20015

Office of Training Support
Peace Corps
Washington, D.C. 20525

Pacific Scientific Information Center
Bernice Place, Bishop Museum
Honolulu, Hawaii 96819

Pan American Union
Washington, D.C. 20006

Rockefeller Foundation
111 West 50th Street
New York, N.Y. 10020

United Nations Educational Scientific and Cultural Organization
U.N.E.S.C.O. Publications Center
317 East 34th Street
New York, N.Y. 10016

United States Information Agency
1776 Pennsylvania Avenue, N.W.
Washington, D.C. 20000

United States Agency for International Development
Box 927
State Department
Washington, D.C. 20523

World Health Organization
Office of Public Information
523 23rd Street, N.W.
Washington, D.C. 20037

Books and Pamphlets

Adventures in Indoor Color Slides, Eastman Kodak Company, Rochester, New York

Adventures in Outdoor Color Slides, Eastman Kodak Company, Rochester, New York

Biegeleisen, J. I., and Cohn, Max A., *Silk Screen Techniques,* Dover Publications, Inc., New York, 1958.

Brown, James W.; Lewis, Richard B.; and Harcleroad, Fred B., *AV Instruction: Media and Methods,* McGraw-Hill Book Company, New York, 1969.

Dale Edgar, *Audio-Visual Methods in Teaching,* Dryden Press, New York, 1969.

Gaskill, A., and Englander, D., *How to Shoot a Movie Story,* Morgan and Morgan, Inc., New York, 1960.

Gunning, Robert, *The Technique of Clear Writing,* McGraw-Hill Book Company, New York, 1952.

Kemp, J., and others, *Planning and Producing Audio-Visual Materials,* Chandler Publishing Company, San Francisco, California, 1968.

Mager, Robert F., *Preparing Instructional Objectives,* Fearon Publishers, Palo Alto, California, 1962.

Manual 1 on Adult and Youth Education, Filmstrips, Use, Evaluation and Production, U.N.E.S.C.O., United Nations, 1959.

Manual 2 on Adult and Youth Education, Literacy Primers, Construction, Evaluation and Use, U.N.E.S.C.O., United Nations, 1959.

Miller, Thomas H., and Brummitt, Wyatt, *This is Photography,* Doubleday, Garden City, New York, 1955.

Minor, Ed., *Simplified Techniques for Preparing Visual Instructional Materials,* McGraw-Hill Book Company, Inc. New York, 1962.

Movies with a Purpose, Eastman Kodak Company, Rochester, New York, no date.

Nelson, Leslie W., *Instructional Aids and How to Make Them,* William C. Brown Company, Dubuque, Iowa, 1958.

Nolen, Barbara, and Goetz, Delia, *Writers' Handbook for the Development of Educational Materials, Bulletin* 1959, No. 19, United States Department of Health, Education and Welfare, 1959. (Can be ordered from the United States Government Printing Office, Washington, D.C.)

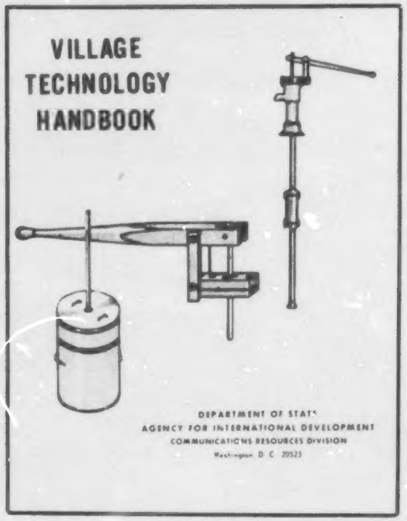
Spear, J., *Creating Visuals for TV*, Division of Audiovisual Instructional Service, National Education Association, Washington, D.C., 1962.

Using Visuals in Agricultural Extension Programs, United States International Cooperation Administration, Washington, D.C.

Village Technology Handbook, Department of State, Agency for International Development, Communications Resources Division, Washington, D.C.

Village Technology Handbook, 2, CI-12, Department of State, Agency for International Development, Communication Resources Division, Washington, D.C. 20523.

Wittich, Walter A., and Schuller, Charles F., *Audiovisual Materials: Their Nature and Use*, Harper and Row, Publisher, New York, 1967.



VILLAGE
TECHNOLOGY
HANDBOOK

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
COMMUNICATIONS RESOURCES DIVISION
Washington D.C. 20523

Journals and Periodicals

Audiovisual Communication Review
DAVI, NEA
1201 - 16th Street, N.W.
Washington 6, D.C., U.S.A.

Audiovisual Instruction
DAVI, NEA
1201 - 16th Street, N.W.
Washington 6, D.C., U.S.A.

CETO News
Center for Educational Television Overseas
The Studio, Nuffield Lodge
Regent's Park, London N.W. 1, England

Extension in Africa
Food and Agriculture Organization
UNESCO
2 Place de Fontenoy
Paris 7e, France

National Association of Educational Broadcasters Journal
119 Gregory Hall
Urbana, Illinois, U.S.A.

OVAC Bulletin
Overseas Visual Aids Centre
31 Tavistock Square
London, W. C. 1, England

Reports and Papers on Mass Communications
Mass Comunication Techniques Division
UNESCO
2 Place de Fontenoy
Paris 7e, France

Visual Education
Educational Foundation for Visual Aids
33 Queen Anne Street
London W. 1, England

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